

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

EVERETT HADIX, et al.,)	
)	
Plaintiffs,)	
)	Case No. 4:92-CV-110
v.)	
)	HONORABLE RICHARD A. ENSLEN
PERRY JOHNSON, et al.,)	
)	
Defendants.)	
_____)	

FINDINGS OF FACT AND CONCLUSIONS OF LAW

I. PROCEDURAL BACKGROUND AND ISSUES PRESENTED

1. In 1980, Everett Hadix and other prisoners incarcerated at the State Prison of Southern Michigan, Central Complex (“SPSM-CC”) brought a class action pursuant to 42 U.S.C. § 1983 in the United States District Court for the Eastern District of Michigan against various state officials charged with the operation of SPSM-CC. *See Hadix v. Johnson*, 367 F.3d 513, 515-17 (6th Cir. 2004).¹ (*See also* Dkt. Nos. 1846 & 1863.) The inmates asserted that their conditions of confinement violated their rights under the First, Eighth, Ninth, and Fourteenth Amendments. *Hadix*, 367 F.3d at 515-17.

¹ The history of this case is also stated in other decisions of the Sixth Circuit Court of Appeals, *see Hadix v. Johnson*, 228 F.3d 662 (6th Cir. 2000); 144 F.3d 925 (6th Cir. 1998); 143 F.3d 246 (6th Cir. 1998); 133 F.3d 940 (6th Cir. 1998), and of the District Courts, *see Hadix v. Johnson*, 45 F. Supp. 2d 584 (E.D. Mich. 1999); 947 F. Supp. 1113 (E.D. Mich. 1996); 947 F. Supp. 1100 (E.D. Mich. 1996); 933 F. Supp. 1360 (E.D. Mich. 1996); 879 F. Supp. 743 (E.D. Mich. 1995); 896 F. Supp. 697 (E.D. Mich. 1995); 792 F. Supp. 527 (E.D. Mich. 1992); 740 F. Supp. 433 (E.D. Mich. 1990); 712 F. Supp. 550 (E.D. Mich. 1989); 694 F. Supp. 259 (E.D. Mich. 1988).

2. Five years later, on April 4, 1985, the parties entered into a comprehensive Consent Decree covering most aspects of health care; fire safety; sanitation; safety and hygiene; overcrowding and protection from harm; volunteers; food service; management; operations; access to courts; and mail. *Id.*

3. Though the state officials admitted no liability on the inmates' claims, the Decree explicitly stated that it was intended by the parties to assure the constitutionality of the conditions under which prisoners are incarcerated at SPSM-CC. *Id.* Under the Consent Decree's terms, the state officials could apply for termination of the decree when they were in compliance with all decree provisions. *Id.* The District Court retained jurisdiction to enforce the terms of the Consent Decree until compliance was achieved. *Id.*

4. In 1992, the District Court for the Eastern District transferred the medical and mental health components of the Consent Decree to this Court.² *Id.*

5. The Consent Decree in this case provides: "This was an action brought pursuant to 42 U.S.C. § 1983 and other applicable statutes seeking declaratory and equitable relief with respect to the conditions of confinement at . . . SPSM-CC Plaintiffs are prisoners at the SPSM-CC and represent themselves and the class of all prisoners who are now or will be confined within said institution. Defendants are state officials charged under Michigan law with the operation of SPSM-CC." (Consent Decree, Intro. at 1.)

6. At the time of the entry of the Consent Decree, April 1985, SPSM-CC consisted of Cell Blocks 3, 4, 5, 6, 8, 11, 12 and administrative segregation (which was the hospital). (*See*

² On January 8, 2001, this Court entered its order terminating in all respects Section II.B (mental health care) of the Consent Decree.

Jan. 8, 2002 Aff. of Barbara Hladki; Dkt. Nos. 1540 & 1846.) 6-Block only consisted of galleries base through 3. The 4th gallery (also known as “top 6”) was part of the Reception and Guidance Center. Block 7 was then, as it is now, the Reception and Guidance Center. (*Id.*) Cell Blocks 1 and 2 were the North Complex, and Cell Blocks 9, 10 and 16 were the South Complex. (*Id.*) Block 16 was demolished and is being replaced with a new housing unit. (*Id.*) A and B units, which are now part of the Reception and Guidance Center, did not exist at the time the Consent Decree was entered, and when they were first built they were part of the Parnall Correctional Facility. (*Id.*) C Unit did not exist at the time the Consent Decree was entered, and is now administered by the Egeler Correctional Facility. (*Id.*) The Duane Waters Hospital did not exist at the time the Consent Decree was entered. (*Id.*)

7. The Sixth Circuit in *Hadix v. Johnson*, 367 F.3d 513, 517-18 (6th Cir. 2004), affirmed that the locations of the cellblocks at the time that the Consent Decree was approved do not control whether a particular facility is governed by the Consent Decree. (*See also* Opinion, Mar. 31, 2005, Dkt. No. 1863 at 8-11.)

8. In April of 1996, Congress enacted the Prison Litigation Reform Act (PLRA), Pub. L. No. 104-134, 100 Stat. 1321-66 (1996). “Enacted in part in response to criticisms that federal courts had overstepped their supervisory authority in prison conditions cases, the PLRA was specifically intended to limit the use of court-enforced consent decree cases and to restrict ‘the ability of Federal judges to affect the capacity and conditions of prisons and jails beyond what is required by the Constitution and Federal law.’” *Hadix*, 228 F.3d at 665 (citing *Hadix*, 144 F.3d at 931 (internal quotation omitted)).

9. After enactment of the PLRA, Defendants moved for termination of the Consent Decree in the Eastern District pursuant to 18 U.S.C. § 3626(b)(2). *Hadix*, 228 F.3d at 665-66. On November 1, 1996, the Eastern District denied Defendants' motion to terminate the Consent Decree, ruling that the termination provisions of the PLRA were unconstitutional on separation-of-powers grounds. *Id.* at 666. On appeal, the Sixth Circuit reversed the Eastern District's judgment. *Hadix v. Johnson*, 133 F.3d 940, 941 (6th Cir. 1998). The Sixth Circuit remanded the case to the Eastern District for consideration of the merits of Defendants' termination motion. *Id.*

10. On March 18, 1999, the Eastern District issued its ruling on Defendants' motion for termination, and focused its attention on whether there had been substantial compliance with the Consent Decree with regard to the facilities designated in the break-up plan. *Hadix v Johnson*, 45 F. Supp. 2d 584 (E.D. Mich. 1999). The Eastern District unconditionally terminated certain portions of the Consent Decree, and conditionally terminated other provisions. On October 5, 2000, the Sixth Circuit reversed the Eastern District's order terminating the Consent Decree, and remanded the case. *Hadix v Johnson*, 228 F.3d 662 (6th Cir. 2000).

11. On March 18, 1999, the Eastern District also transferred sections I.P., I.Q., and I.S. of the Consent Decree (regarding water temperatures, housing temperatures and ventilation, respectively) pertaining to Facility B (formerly Cell Blocks 4 and 5, now the Southern Michigan Correctional Facility or JMF) to this Court. (E. Dist. Dkt. No. 1342; Dkt. No. 1863.) *See also Hadix*, 367 F.3d at 515-17. The Eastern District further transferred to this Court Defendants' proposed alternatives to Facility A (Cell Blocks 1, 2 and 3 of the Egeler Correctional Facility or SMN). *Id.* The Eastern District explained that the rationale for transfer was that health care was implicated in these provisions.

12. On December 2-3, 1999, this Court conducted hearings on the medical health care provisions of the Consent Decree and other issues transferred by the Eastern District. *Id.* Subsequently, on February 18, 2000, this Court issued its Order and Findings of Fact and Conclusions of Law. (Dkt. Nos. 1372 & 1373.) This Court determined that Plaintiffs sustained their burden by proving the existence of constitutional violations with regard to section II.A.3.6, II.A.4.a, II.A.5.a, II.A.7, and II.A.11, and that Plaintiffs failed to sustain their burden of proving the existence of constitutional violations as to the remaining health care provisions of the Consent Decree and terminated its jurisdiction over those provisions. Additionally, this Court found that the temperature, ventilation and fire safety conditions at JMF, Egeler, and Administrative Segregation supported a finding of constitutional violations. *Hadix*, 367 F.3d at 515-17. The February 18, 2000 Order was not final, as the Court reserved judgment on termination of other portions of the Consent Decree and the entry of any remedial order.³ *Id.*

13. On November 15, 2000, the Eastern District transferred to this Court the fire safety issues which are the same as to those concerning Facility A previously transferred. (E. Dist. Dkt. No. 1432.)

14. On June 27, 2001, the Eastern District issued its Order of Termination, terminating its jurisdiction over all sections of the Consent Decree remaining in the Eastern District. (E. Dist. Dkt. No. 1442.)

³This case is considerably more complex than these fire safety findings indicate. Many aspects of the case—mental health, legal access, temperature, water and particular health care issues—have resulted in termination of District Court jurisdiction. However, two very significant issues have remained due to persistent Constitutional violations—fire safety and health care. The statement of the litigation history herein excludes reference to many of the terminated issues.

15. Following the transfer of the fire safety issues at Egeler, but prior to the transfer of the same issues at Parnall, the Court held a hearing on Defendants' motion for termination of injunctive relief pursuant to the Prison Litigation Reform Act ("PLRA"), 18 U.S.C. § 3626(b). The Court thereafter issued findings in which it concluded that Defendants' failures to address the fire safety dangers at the Egeler Facility had resulted in current and ongoing constitutional violations. (Findings of Fact and Conclusions of Law, Feb. 18, 2000 ("2000 Findings"), Dkt. No. 1372 at 51.)

16. Defendants were also ordered on May 2, 2001 to report on their remedial plans to address fire safety. (Dkt. No. 1443). In response, Defendants failed to propose any remedy for the fire safety violations. (Dkt. No. 1445 at 2.)

17. On May 6-8, 2002, this Court conducted hearings on the remaining medical health care provisions of the Consent Decree and other issues transferred by the Eastern District. The issues included fire safety in both the Egeler and Parnall facilities in May 2002. Subsequently, on October 29, 2002, this Court issued its Order and Injunction and Findings of Fact and Conclusions of Law. (Dkt. Nos. 1658 & 1659.) The Court determined that the existing system of health care continues to violate Sections II.A.3.6, II.A.4.a, II.A.5.a, II.A.7, and II.A.11 of the Consent Decree and the Eighth Amendment. *Hadix, supra*, 367 F.3d at 517. The Court further found that Defendants' failure to protect prisoners from heat-related illnesses and the risk of injury from smoke and fire for prisoners with disabilities and chronic diseases resulted in violations of the Consent Decree and Constitution. *Id.* The Court found a constitutional violation with regard to the lack of fire safety in Blocks 1-3 and 7 of the Egeler Facility and Block 8 of the Parnall facility.

(Findings of Fact and Conclusions of Law, Oct. 29, 2002 (“2002 Findings”), Dkt. No. 1658 at 263.)

18. The Court again ordered further submissions on the appropriate remedy for the constitutional violation with regard to fire safety. (2002 Findings 264.)

19. Consistent with the 2002 Findings, the Court later ordered the parties to further brief whether any alternative to compartmentalization,⁴ consistent with Section VIII of the Consent Decree, was constitutionally sufficient as a fire safety remedy. (*Id.*) After briefing, on February 25, 2003, this Court issued its Injunction ordering compartmentalization of the facilities as the fire safety remedy, since other proposed remedies were not constitutionally sufficient. (Dkt. Nos. 1696 & 1697.)

20. On December 23, 2003, Defendants submitted a fire remedy plan including compartmentalization, entitled “State Prison of Southern Michigan Fire Safety and Egress Report for Cell Blocks 1, 2, 3, & 7 and Cell Block 8.” (“Plan”) (Dkt. No. 1739.) Defendants further indicated that subject to certain conditions they would voluntarily proceed with that portion of the Plan which concerned:

1. Expansion of the fire protection system to provide fire protection throughout each cell block;
2. Removal of the transformers and other electrical equipment that are no longer in use in the basement;
3. Increasing the guardrail height at the open side of the walkway at each tier of elevated cells; and
4. Removal of the unenclosed storage areas and laundry facilities and construction of a one-hour rated wall around the laundry facility at the Parnall Correctional Facility.

⁴ Compartmentalization refers to physical modifications which divide the cell blocks into smaller units to limit the spread of fire and smoke, and to facilitate access to safe refuge by reducing the distance a prisoner travels to exit and to eliminate the need to use stairs to exit.

The portions of the Plan that Defendants did not agree to complete voluntarily were: a) installation of a mechanical smoke exhaust system in Cell Blocks 1, 2, 3, 7 and 8; b) replacement of the manual remote cell door locking system in Cell Blocks 1, 2 and 3 with a remote electronic cell door locking/unlocking system; and, c) installation of a vertical dividing wall on each side of Egeler's Cell Blocks 1, 2 and 3 and across the center of the atrium in 7 and 8 Blocks.

21. On February 2, 2004, this Court issued its Order preliminarily approving Defendants' fire safety plan pending further hearing. (Dkt. No. 1751.)

22. On February 25, 2003, the Court issued an injunction requiring completion of the Plan:

The very substantial failures of these facilities to allow for timely egress in the event of a fire, to exhaust smoke, to sprinkle fire, and to unlock doors means, simply, that many inmates in each facility would likely suffer smoke inhalation or death in the event of fire. Simply put, these risks are grave and unacceptable.

(Dkt. 1696 at 1-2.)

23. The Court ordered Defendants to implement the break-up plan developed pursuant to Section VIII of the Consent Decree, with the additional step of subdividing Egeler so that the exit distance from any cell would not exceed 150 feet. In addition, the Court ordered Defendants to correct the deficiencies previously found in the unlocking systems, exhaust systems and sprinkler systems of Blocks 1-3 and 7-8, or adopt other ameliorative changes that would offer equivalent levels of fire protection. (*Id.*)

24. Defendants appealed to the Sixth Circuit from the injunction issued by this Court. The Court of Appeals affirmed in part, reversed in part, and remanded the fire safety issue to this Court, asking the Court to identify the point at which the fire safety deficiencies in the record become constitutional violations. The Court of Appeals noted the following:

[T]his Court was informed at oral argument that Defendants have taken steps to remedy some of the problems noted by the district court, such as removing the dry transformers from the basement and installing additional sprinklers. It is unclear to us whether those remedies are sufficient to cure the constitutional violations at the *Hadix* facilities.

Hadix, 367 F.3d at 529.⁵

25. On July 29, 2004, Defendants' counsel advised the Court, Court Monitor, and the Plaintiffs that pursuant to Defendants' Plan, "MDOC maintenance staff have removed the six transformers and four oil switches from the basement of Parnall's 8-Block." (Dkt. No. 1846.)

26. On August 5, 2004, this Court issued its Order which provided in part that the parties should file simultaneous briefs on the process which should be used to resolve the fire safety remand from the Sixth Circuit. (Dkt. No. 1771.)

27. On August 17, September 7, and September 17, 2004, Defendants' counsel advised the Court, Court Monitor, and the Plaintiffs that as part of Defendants' voluntary self-remedy, the transformers and all electrical equipment had been removed from the basement in Egeler Cell Blocks 1, 2, 3 and 7, and Parnall Cell Block 8. (Dkt. No. 1846.)

28. On September 28, 2004, this Court issued its Scheduling Order (Dkt. No. 1775), which provided for the filing of a detailed schedule for fire safety improvements planned, discovery, site visits by the experts, and an evidentiary hearing. Subsequently, on October 14, 2004, Defendants filed their Schedule for Fire Safety Improvements. (Dkt. No. 1785.)

29. On October 12, 2004 and December 1, 2004, Defendants' counsel advised the Court, Court Monitor, and Plaintiffs that pursuant to Defendants' Plan, the MDOC completed the

⁵The Court also understands because of its long history with this case that compartmentalization was originally agreed upon in the Consent Decree as a security feature, but was later championed by Plaintiffs, but not Defendants, for its potential as a fire safety remedy. *See Hadix*, 367 F.3d at 519.

removal of the unenclosed storage areas and laundry facilities and had increased the guardrail height in Egeler Cell Blocks 1, 2, 3 and 7 and Parnall Cell Block 8. (Dkt. No. 1846.)

30. On February 28, 2005, Defendants filed their Expedited Motion to Dismiss the Court's Attempt to Exercise Jurisdiction Over Facilities Not Subject to the Consent Decree and/or Issues and Facilities Previously Terminated by the Federal Court. (Dkt. Nos. 1846 & 1847.)

31. On March 31, 2005, this Court issued its Opinion and Order granting in part and denying in part Defendants' Motion to Dismiss. (Dkt. Nos. 1863 & 1864.) The Court held that the fire safety issues before the Court did not include cell blocks at the JMF Facility and Blocks 9 and 10 of the Parnall Facility. (*Id.*) JMF had been dismissed by the Eastern District on a finding that the plan for that facility had been fully implemented; Blocks 9 and 10 of the Parnall Facility are non-*Hadix* facilities. (*Id.*) This Court denied Defendants' Motion as to the "support" facilities for Cell Block 8 of the Parnall Facility and the Egeler Facility. (*Id.*)

32. On April 29, 2005, the parties filed a Stipulation to Terminate Jurisdiction Over Certain Areas Regarding Fire Safety Issues, which was approved by Order of May 4, 2005. (Dkt. Nos. 1876 & 1878.) These areas concerned the Parnall creamery; Parnall meat processing plant; Jackson prison complex power plant; Parnall chow hall; Egeler chow hall; and MSI shoe factory/box and carton factory in Parnall. (*Id.*)

33. The parties filed a Stipulation, on August 1, 2005, to terminate fire safety relief as to the MSI laundry, which was approved by Order of August 4, 2005. (Dkt. Nos. 1893 & 1894.)

34. The only remaining "support facility" at issue is the SMT/MSI metal furniture factory. The SMT/MSI metal furniture factory is a two-story building with a basement. The only

issue for the SMT/MSI metal furniture factory concerns the storage and handling of xylene fluids on the second floor painting area and the storage of mineral fluids on the first floor.

35. The Court held an evidentiary hearing on May 5-6, 2005 on whether the lack of fire safety at the facilities violates the Eighth Amendment and, if so, what remedy is necessary to address that violation.

II. BACKGROUND OF THE WITNESSES

A. EXPERT WITNESSES

36. Curtiss Pulitzer is a licensed architect with over 29 years of experience in the planning and development of justice facilities in more than 40 states including prisons in Arkansas, Delaware, Florida, Hawaii, Iowa, Maine, Minnesota, New Hampshire, North Carolina, Pennsylvania, Tennessee, Vermont, and the District of Columbia. He has worked on the planning and design of six different reception centers, including both new and renovated facilities. (Hearing Transcript (“Tr.”) 217-18; Pls. Ex. 2.) He provided credible expert testimony.

37. Michael DiMascio is an expert in fire protection engineering. He is a registered Professional Fire Protection Engineer. His education includes a degree in civil engineering and an M.S. degree in fire protection engineering. He has experience with large correctional facilities and with older correctional facilities. He is a member of a number of professional organizations, including the Society of Fire Protection Engineers (SFPE), the National Fire Protection Association (NFPA), the Building Officials and Code Administrators (BOCA), NFPA 921 Technical Committee (Guide for Fire and Explosion Investigators) (Past Member), and the NFPA 101, Code for Safety to Life from Fire in Buildings and Structures, Subcommittee on Detention and Correctional Occupancies. (Pls.’ Ex. 1A.) He provided credible expert testimony.

38. Dr. Jerome Walden graduated from the University of Michigan Medical School and is certified by the American Board of Family Physicians. He is the founder and executive director of the Packard Community Clinic. His previous positions include serving as Chief Medical Officer of the U.S. Penitentiary in Terre Haute, Indiana. He was selected by the Michigan Academy of Family Physicians as the Family Physician of the Year in 2000. He has testified as an expert witness in a number of cases, and has served as the Plaintiffs' expert witness in this case since 1999. (Pls.' Ex. 3A at 1-2; *see also* Pls.' Ex. 3B at 2-3.) He provided credible expert testimony.

39. Elizabeth J. Ferguson is Plaintiffs' expert in aging and disability systems, programs and services. She has testified for Plaintiffs on prior occasions in this case and has previously provided expert testimony regarding aging and disabilities service systems. (2002 Findings ¶ 45; 2000 Findings ¶ 27.) She provided credible expert testimony.

40. Wayne G. Carson is a consulting fire protection engineer and operates his own firm. Mr. Carson has consulted for governmental and non-governmental agencies. He is a licensed engineer in five states and the District of Columbia, and has been qualified as a fire safety expert in many states, and in this Court. He has inspected over 75 correctional facilities around the country. He is very familiar with the Life Safety Code and has done extensive past committee work, including drafting code provisions, regarding the Life Safety Code, the Fire Protection Handbook and the BOCA National Building Code. (*See also* Tr. 189-90.) He has authored numerous papers and publications. He provided credible expert testimony.

41. Frederick W. Mowrer is an Associate Professor in the Department of Fire Protection at the University of Maryland. (Tr. 143.) He holds a Ph.D. in Fire Protection Engineering and Combustion Science; an M.S. in Engineering; and a B.S. in Fire Protection and

Safety Engineering. Prior to his present position, Dr. Mowrer was a lecturer in civil engineering at the University of California (Berkley) and a fire protection engineer. Dr. Mowrer is a registered fire protection engineer in the State of California. Dr. Mowrer has held and continues to hold numerous positions with the Society of Fire Protection Engineers, NFPA, International Association of Fire Safety Science, and the International Standards Organization. Dr. Mowrer has received numerous awards and honors in the field of fire protection. Dr. Mowrer has authored or contributed to over 100 publications. He provided credible expert testimony.

42. Dr. George Pramstaller is the MDOC's Chief Medical Officer. (2002 Findings ¶¶ 39-41.) He has extensive medical experience within MDOC and in private practice. (*Id.*) Prior to assuming his current position, he was MDOC Director of Medical Services for Region I. (*Id.*) Dr. Pramstaller is a certified Correctional Health Professional, a Fellow-American College of Osteopathic Family Physicians, and Board Certified in Family Practice. Dr. Pramstaller is a member of numerous professional associations, including the Society of Correctional Physicians and the American Correctional Health Services Association. He is on the Board of Directors of the National Commission on Correctional Health Care. (*Id.*) He provided credible expert testimony.

B. LAY WITNESSES

43. Thomas R. Smith is employed as Project Manager with Fishbeck, Thompson, Carr and Huber, Engineers, Scientists and Architects, Grand Rapids, Michigan. (Tr. 127-28.) He holds a Master's Degree in architecture. (*Id.*) He is a Project Manager on large multi-discipline projects, typically institutional occupancies such as health care, hospitals, long-term care, nursing facilities and detentional occupancies. (*Id.*)

44. Eugene Fushi is employed by the MDOC as a Regional Fire Inspector. (*Id.* at 12.) Mr. Fushi oversees the prisons within the Jackson region, including the Egeler and Parnall Facilities. (*Id.*)

45. Barbara Hladki is employed by the MDOC as Administrator, Jackson Medical Complex, Bureau of Health Care Services. (*Id.* at 110-11.) Her duties include the supervision of all health care staff within the Jackson Medical Complex (with the exception of mental health staff and medical service providers), quality assurance, audits, and reviews. (*Id.*)

46. Thomas Meeker is employed by the MDOC as a Resident Unit Officer (RUO) in 8-Block at Parnall. (*Id.* at 76.) He has been assigned to 8 Block for the last five to seven years, and has been working at the Parnall Facility for 19 years. (*Id.* at 78.) He is currently assigned work during first shift hours (5:18 a.m. – 1:18 p.m.). (*Id.*)

47. Ronald Embry is employed by the MDOC as an Assistant Resident Unit Supervisor (ARUS) in 8-Block at Parnall. (*Id.* at 81-82.) He has been assigned to Block 8 for five years. (*Id.*) Embry has supervisory responsibilities over the RUOs and reports to a Resident Unit Manager (RUM). (*Id.*) His working hours are 8:00 a.m. – 4:30 p.m., with the exception of Mondays when his hours are 11:00 a.m. – 7:30 p.m. (*Id.*)

48. William Denman is currently employed as the RUM for Block 7. (*Id.* at 103.) He has held his current position since December 2004. Previously, he was the RUM at Blocks 1, 2 and 3 for over 11 years. (*Id.*)

49. Robert Hughes was, at the time of hearing, a prisoner incarcerated within the MDOC. (Tr. 326-28.) He was housed in Block 1 (the Reception Center) at the time of a fire in

his housing unit in December 2004. (*Id.*) At the time of the fire, his movement was slowed because he uses a wheelchair due to paralysis. (*Id.*)

50. Donald Donaldson was, at the time of hearing, a prisoner incarcerated within the MDOC. (Tr. 339-40.) He was housed in Block 10 at the time of a fire in his housing unit in March 2005. (*Id.*)

51. Ronald Kovaleski was, at the time of hearing, a prisoner incarcerated within the MDOC. (Tr. 345-46.) He is a Plaintiff representative in the action and has testified on prior occasions. He provided testimony about fire drills and evacuation procedures at Block 8. (*Id.*)

III. PHYSICAL DESCRIPTION OF BLOCKS

A. BLOCKS 1, 2 AND 3_____

52. The cells in Blocks 1-3 are arranged back-to-back in the center of the block and face the outer walls. (*See* Pls.' Ex. 23.)

53. Blocks 1-3 are approximately 276 feet long by 59 feet wide by 42 feet high. (2002 Findings ¶ 1387.)

54. The ceiling height in Blocks 1-3 is 51 feet. (*Id.* ¶ 1398.)

55. There are also 16 cells for the disabled and 24 quarantine cells in Block 1. The quarantine cells have solid doors with a food slot and must be individually unlocked. Some of the cells for the disabled are singles; others are doubles. (Tr. 26-27, 222, 249-50, & 329.)

56. Cell Block 1 contains a series of observation or quarantine and handicapped cells located at base level. (*Id.* at 26.) These cells need to be key released by an officer. (*Id.* at 27.) The quarantine cells have solid fronts, but do not protect against smoke inhalation. (*Id.*) The rest of the cells on the base level and all of the cells on the first through fourth galleries have open

fronts and may be released remotely by the breaker bar at each end of the gallery. However the locking mechanisms have been frequently broken. The diagram of the cell blocks is depicted at Defendants' Exhibit 2.

57. The MDOC has raised the rail heights in the cell blocks from 36 to 48 inches by adding a third rail and additional vertical railings in each gallery. (*Id.* at 43.)

58. Cell Blocks 1, 2 and 3 have been fully sprinkled by adding sprinklers to the attic, basement, and end spaces of the cell blocks. (*Id.* at 44.)

59. Defendants represented that loose laundry combustibles that had been stored at the ends of Cell Blocks 1, 2 and 3 were removed. (*Id.*) However, at the time of Plaintiffs' expert tour on March 18, 2005, there was a pile of laundry in a laundry bin near the laundry room in Block 8. The laundry pile was approximately three feet by six feet by four feet. (Pls.' Ex. 3B at 19-20.)

B. BLOCK 7

60. Block 7 is a five-story open structure with five tiers of open-front cells on either outside wall facing each other across an open common area. It is 362 feet long by 59 feet wide by 51 feet high. The block contains approximately 19,000 square feet. (2002 Findings ¶ 1388.) A diagram of the cell block is depicted in Defendants' Exhibit 2.

61. The galleries are about three feet wide and have a pinch point, a narrowing of the gallery, to 20 or 24 inches wide. (Tr. 252; Pls.' Ex. 3B at 16 & 18.)

62. The atrium in Block 7 has fixed chairs and tables. (Pls.' Ex. 3B at 14; Tr. 252.)

63. The MDOC has raised the rail heights in the cell blocks from 36 to 48 inches by adding a third rail and additional vertical railings in each gallery. (Tr. 43.)

64. Cell Block 7 has been fully sprinkled by adding sprinklers to the attic, basement, and end spaces of the cell blocks. (*Id.* at 44.)

65. The replacement bedding under the officer's station has also been removed. (*Id.* at 45.)

66. Ms. Ferguson testified that fixed seats in restaurants and courtrooms were examples of furniture arrangements that provided defined aisles. (Tr. 284.) One area of Block 7's atrium contains fixed seats and tables. (*Id.*)

C. BLOCK 8

67. Block 8 of Parnall is approximately 287 feet long by 51 feet high. (2002 Findings ¶ 1185.) Like Block 7, Block 8 is a five-story open structure with five tiers of cells on either outside wall facing each other across an open common area. (*Id.* ¶¶ 1185 & 1388.)

68. The galleries in Block 8 are also between 30 and 36 inches wide and have pinch points at the center of each which measure 24 inches wide. (Pls.' Ex. 3B at 16, 18.)

69. Parnall Cell Block 8 cells are all open front cells that can be opened electronically from the end of the galleries and from the control center, in addition to being able to be unlocked by the officer's key. A diagram is provided at Defendants' Exhibit 2.

70. The MDOC has raised the rail heights in the cell blocks from 36 to 48 inches by adding a third rail and vertical railings in each gallery. (Tr. 43.)

71. Cell Block 8 has been fully sprinkled by adding sprinklers to the attic, basement, and end spaces of the cell blocks. (*Id.* at 44.)

72. The loose laundry combustibles that had been stored at the ends of Cell Block 8 were removed; and a one-hour rated, fire-door laundry room in 8 Block has been completed. (*Id.*)

D. THE SMT/SMI METAL FURNITURE FACTORY

73. This building has a walk-in basement level and two upper floors. There is no fire safety issue on the basement level. In one end of the first floor, there is a painting operation. As part of that operation, xylene is used to clean the paint equipment. It is stored in multiple 55-gallon drums in a locked metal cage. The cage is ventilated to the outside by a 16 inch fan. Plaintiffs contended that the drums should have be grounded and bonded as well as surrounded by industrial fire safety walls. Defendants represented in a post-hearing brief that after the May 5-6, 2005 hearing, they have grounded and bonded the xylene drums. (Defs.' Proposed Finding ¶ 66.) Plaintiffs also contended that the drums should be sealed around the hand pumping equipment in the top of the drums. Defendants also represented in a post-hearing brief that after the hearing, they applied and installed seals on the drums. (*Id.*)

74. On the second floor of the metal furniture factory there is another lockable metal cage area where several 55-gallon drums of mineral spirits used for lubrication and cleaning are stored. The parties disagreed whether additional modifications are required in the metal furniture factory with regard to the storage and handling of the xylene and mineral spirits. Mr. DiMascio testified that the metal factory lacks a proper chemical storage and dispensing area, meaning the area is not surrounded by sufficient fire safety walls for flammable industrial uses given the quantity of chemicals. (Tr. 312.) In their post-hearing brief, Defendants represented that "The same issues described for the xylene barrels have been resolved in the same way for the mineral spirits barrels." (Defs.' Proposed Findings ¶ 66.)

IV. PRISONER CHARACTERISTICS

A. EGELER

1. CLASSIFICATION

75. The Egeler Correctional Facility is now the reception center for all male prisoners.

76. PD 04.01.150 Reception Center Services, effective February 14, 2005, governs the processing of prisoners into the facility and preparing those prisoners for transfer to their first permanent location. (Pls.' Ex. 6.)

77. Prisoners arriving in Egeler are treated as Level V prisoners for purposes of personal property, Defs.' Ex. 4, and state issue property, Defs.' Ex. 3. This is significantly less property than prisoners in Egeler possessed in 2002 when Egeler was a Level II general population prison. (Tr. 104-05.)

78. Prisoners arriving at Egeler and not receiving immediate placement in the hospital or Unit C, are placed in Blocks 1, 2 or 3.

79. Block 1 contains a group of cells on Base on the south side that are called quarantine cells. These cells are used for segregation and for prisoners with medical problems. Suicidal prisoners are commonly housed there. (Pls.' Ex. 3B at 7-8.)

80. After the prisoner's initial health screening and classification, they move to Block 7 to await transfer to their regular housing assignment in another facility.

81. Information gained through the intake history and physical examination is relevant to making housing decisions. (Pls.' Ex. 3B at 32.)

82. Prisoners frequently do not provide their history or receive their physicals for 15 days. (Pls.' Ex. 3B at 32-33; Pls.' Ex. 5 at 3.)

83. On average, 243 prisoners enter the reception process at Egeler each week. (Pls.' Ex. 46 at 5.)

84. Defendants estimate that healthy prisoners without special needs are transferred from Egeler within 30 days. (Pls.' Ex. 46 at 5.) Policy provides that intake processing shall normally be completed within four weeks of arrival at Egeler. (Pls.' Ex. 6 at 7.)

85. Prisoners with serious health problems who remain for more than 30 days are typically housed in Block 7. (Tr. 218; Pls.' Ex. 46 at 5; Pls.' Ex. 7B.)

2. HEALTH CHARACTERISTICS

86. It is a persistent characteristic of these *Hadix* facilities that they involve a relatively high percentage of infirm prisoners. (*See* ¶ 402 *infra*.)

87. The prisoners arriving as new commitments and as parole violators come in with a mix of health characteristics. As prisoners are health screened, some of them are listed in the MDOC's HC-251 and/or HC-261 reports. HC-251 lists prisoners who are eligible for a special accommodation. HC-261 lists prisoners who are assigned to a chronic care clinic. (Defs.' Exs. 21, 24, 25 & 26.)

88. Prisoners are much more likely than would be members of the general public to meet the criteria for enrollment in a chronic care clinic. (Pls.' Ex. 3B at 34-35.)

89. With minor exceptions, a prisoner must have a serious medical condition to qualify for enrollment in a chronic care clinic. For example, the criteria for enrollment in the Cardiac Chronic Care Clinic are cardiomyopathy, coronary artery disease, dysrhythmia or cardiac arrhythmia, congestive heart failure, valvular heart disease, peripheral vascular disease or other

circulatory diseases. (Pls.' Ex. 3B at 35-37.) The enrollment is not affected by medication which controls the condition.

90. All of these are serious diseases in that they are potentially life-threatening and entail a high rate of morbidity, even though individual cases vary in their degree of severity. (Pls.' Ex. 3B at 37.)

91. Most of these diagnoses require medical monitoring, attention to vital signs and medical history, attention to weight, and attention to laboratory data. (Pls.' Ex. 3B at 38.)

92. Most of the people in the chronic care clinics are on medication and have one or more significant disorder requiring continual monitoring, medication and treatment. (Pls.' Ex. 3B at 146-47.)

93. Ms. Hladki, in her testimony, cautioned that one should not attempt to reach conclusions based on the information in the HC-251 and HC-261 alone regarding the qualitative state of a prisoner's health condition. (Tr. 118-20.) Ms. Hladki referred to Plaintiffs' Exhibit 38, which represented a compilation of those prisoners who have been identified on the April 5, 2005 HC-251 and HC-261 forms. This listing was also correlated with the prisoners' lock locations. However, Ms. Hladki stated on cross examination that the H-251 forms do contain a level of function evaluation. (Tr. 124.)

94. Under the Department's chronic care clinic system, a person with hypertension would be assigned a chronic care clinic. (Tr. 126.) This same person would most likely be identified as "at risk of heat-related illness" and therefore be on the HC-251 list. (*Id.*) Treatment of the condition by medication would not affect either the clinic assignment or the prisoner's "heat-related illness" status. (*Id.*) A prisoner's inclusion on the HC-251 is not always indicative of a

mobility problem. However, there has never been evidence that the health care system has enrolled people in chronic care clinics unnecessarily; rather the system has historically failed to enroll persons who should be enrolled, and failed to assure continuity of medications for persons with chronic diseases, including hypertension. (See 2002 Findings ¶¶ 83-102.)

95. Approximately 20 percent of the population in Egeler is enrolled in a chronic care clinic. This percentage does not include those persons who have yet to receive their history and physical, and therefore have yet to be evaluated for enrollment. (Pls.' Ex. 3B at 32-33; Pls.' Ex. 46 at 5.)

96. In light of the fact that physicals are frequently not completed until the prisoner's fifteenth day in Egeler, and that Defendants estimate the average stay in Egeler at 30 days, the percentage of prisoners who qualify for a chronic care clinic could be higher. (Pls.' Ex. 3B at 98.)

97. Parole violators who have been out of prison for one year or less do not receive new history and physical examinations. The policy that excludes parolees returning to prison within a year from the requirement of a new history and physical has no exception for parolees who report new diseases, or who have abnormal vital signs. (Pls.' Ex. 5 at 3.)

98. The only health appraisal required by policy for parolees returning to prison within a year does not include any physical examination beyond the collection of vital signs and a dental screening and examination. (Pls.' Ex. 5 at 3-4.)

99. Medical conditions that require diagnosis and treatment sometimes go untreated because new histories and physicals are not provided to all prisoners, particularly in light of the high level of disease in the *Hadix* population. (Pls.' Ex. 3B at 24.)

100. New prisoners frequently do not receive their history and physical until the prisoners are almost half-way through their stay in Egeler which means that, at any given time, there are a large number of prisoners whose degree of health risk in the event of a fire has not been fully determined. (*See* Pls.' Ex. 3B at 98.)

101. Ms. Ferguson and Dr. Walden reviewed Defendants' data reported in Defendants' Monthly Report of Prisoners Disabilities and Accommodations (HC-251), the Service Area Clinic Reports (HC-261), and the location reports for prisoners at both the Egeler (Pls.' Ex. 39) and Parnall facilities (Pls.' Ex. 40). (Tr. 258-59; Pls.' Ex. 3B at 20-21.)

102. The HC-251 is commonly called the accommodation report. It lists the prisoner's name, number, diagnoses based on a functional assessment, and the listing of the special accommodations provided to each prisoner. Each of the individually-based assessments and treatment decisions are entered into the a database reflecting the medical determinations made at various points in the process. These data are generated in a monthly report, the HC-251. (Tr. 259.)

103. Associated with each disability description in the HC-251 is a code for "Level of Functioning." The codes are: I (independent), A (needs assistance), and D (dependent). (Pls.' Ex. 17.)

104. The HC-251 lists only chronic or permanent accommodations. For conditions that last six months or less, medical details are used instead. (Tr. 260.)

105. Every prisoner in a facility is listed on the HC-251, whether or not they have a disability or accommodation. (*Id.*)

106. In contrast, not every prisoner is listed on the HC-261, the Chronic Care Clinic report, which is limited to prisoners enrolled in one of the seven chronic care clinics. (*Id.* at 260-61.)

107. Each clinic list contains the names and numbers of the prisoners assigned to that chronic care clinic and the most significant three diagnoses for which they were seen in the most recent visit, so that review of the HC-261 provides a sense of the reasons for enrollment in the chronic care clinic. (*Id.*)

108. Despite the limited information available and the fact that many prisoners in Egeler at any given time have not received a full health review, Dr. Walden identified 38 prisoners who were likely to be at heightened risk in a fire but not housed on Base. (Pls.' Ex. 3B at 47-64; *see also* Pls.' Exs. 37 & 39; Pls.' Proposed Findings, Attach. A.)

109. The prisoners Dr. Walden identified included eight housed on Fourth Gallery and nine on Third Gallery of one of the Egeler cellblocks. (Pls.' Ex. 3B at 47-64; *see also* Pls.' Exs. 37 & 39.)

110. The 38 Egeler prisoners identified by Dr. Walden included a patient who had been noted by Defendants to have a level of functioning requiring assistance by virtue of his HIV infection. An HIV infection would not by itself constitute a mobility impairment. All of the other Egeler prisoners identified by Dr. Walden had been diagnosed by Defendants with either respiratory or cardiac disease, or both. In the majority of cases, these prisoners carried additional diagnoses that Dr. Walden also considered in making his determinations. Among the prisoners identified were prisoners with a visual or hearing impairment, or both.⁶ (160657 & 192354 (both),

⁶The prisoner numbers referenced in this paragraph and others have been used to record prisoner medical issues while safeguarding the privacy of the prisoners at issue.

197427 (visual impairment, level of functioning classified as requiring assistance)). Dr Walden also identified prisoners with restrictions on their ability to stand (217074, housed on fourth gallery), or medical orders that had not been followed to house the prisoner on base (248988, housed on third gallery; 278398, 391369 and 525249 housed on fourth gallery; *see also* 309953, medical order for no heights but housed on second gallery). Prisoner 251306, although not on Dr. Walden's list, was housed on the fourth gallery despite having cardiac and circulatory problems that Defendants classified as a level of functioning needing assistance. (Pls.' Ex. 3B at 52-54, 58, 60-61, 63-64; *see also* Pls.' Exs. 37 & 39.)

111. Ms. Ferguson, in consultation with Dr. Walden, developed five categories of conditions that could lead to difficulties during a fire evacuation. These categories are as follows: difficulty with mobility; breathing; strength and endurance; vision and hearing impairments; or mental or behavioral issues. (Tr. 261.)

112. The categories Ms. Ferguson developed are consistent with the criteria for enrollment in the Disabilities Chronic Care Clinic. In order to be enrolled in that clinic, a prisoner must have at least one of the following diagnoses, functional impairments or structural problems:

- Paraplegia, limb amputations, wheelchair-dependent for mobility, history of skin grafts or flap to buttocks or other pressure areas;
- Individuals requiring assistance with daily living due to body control problems;
- Individuals who require mobility devices for activities of daily living;
- Loss of visual or auditory function which affects activities of daily living;
- History of resolved/cured pressure ulcers;

- Diagnosed neuromuscular diseases such as Multiple Sclerosis or Parkinson's, which result in a functional deficiency;
- Paralysis of any extremity;
- Any physical or body area impairment that substantially limits one or more of the major life activities;
- Unresolved or fluctuating accommodation needs;
- Patients whose physical functional disability limits participation in services, programs and/or activities; or
- Brain injury.

(Pls.' Ex. 34B at 2.)

113. Ms. Ferguson also considered Defendants' training material for preparation of the HC-251 and related forms. Those materials include a definition of respiratory disease, which would tend to indicate a compromised ability to walk or climb stairs. (Pls.' Ex. 17 at 7.)

114. Ms. Ferguson considered Defendants' criteria for determining that a prisoner is at high risk for heat-related injury. The entire set of criteria is as follows: enrollment in the cardiovascular or pulmonary chronic care clinic; over 65 years of age; undergoing renal dialysis; pregnant; or confined to a wheelchair. (Defs.' Ex. 35 at 2 (OP-03.04.100-E (5/21/01))) (May 2002 hearing record.)

115. Based on Ms. Ferguson's functional categories as informed by the enrollment criteria for the disabilities and respiratory chronic care clinics and the heat risk criteria, Ms. Ferguson identified 258 data entries indicating prisoners who would have difficulty with mobility,

breathing, strength and endurance, or following directions out of the Egeler population of 1445 prisoners. (Pls.' Ex. 37; Tr. 261, 262-63; Pls.' Ex. 39C at 57.)

116. At least 34 of the 258 prisoners identified at Egeler have respiratory conditions that impair their walking 100 yards or one flight of stairs. Twenty-two of these were placed on First Gallery (second floor) or above. (Pls.' Ex. 37 at 1.)

117. At least nine of the 258 prisoners identified are coded as "LOF A" (level of functioning: needs assistance); three of these were placed on First Gallery or above. (Pls.' Ex. 37 at 1.) There may be other such prisoners because these calculations were based on incomplete screening data. (Tr. 264; Pls.' Ex. 37.)

118. Ninety-eight of the 258 prisoners identified at Egeler were on Base and would have difficulty exiting for the very reasons they have been placed on Base. (Pls.' Ex. 37 at 1.) Many such prisoners have significant impairments and will probably be released last of all in the event of a fire. (Pls.' Ex. 3B at 67-68, 78.)

119. Ms. Ferguson identified 60 prisoners at Egeler at risk for heat-related illness. (Tr. 264; Pls.' Ex. 37 at 1.)

120. Ms. Ferguson identified 17 prisoners at Egeler as placement mistakes. For these, the HC-251, prepared by medical staff, notes prisoners in need of ground floor housing (Base) who were not housed on Base, which is evident from the prisoners' location. (Tr. 264; Pls.' Ex. 37 at 1.)

121. Ms. Ferguson identified 16 prisoners at Egeler with asthma or chronic airway obstruction who are not listed on the HC-251 with respiratory disease, and who were placed on First Gallery or above. (Pls.' Ex. 37 at 1.)

122. Of the prisoners at Egeler, 20 percent, or 292, are enrolled in chronic care clinics, as follows:

Egeler Chronic Care Clinic (“CCC”) Enrollment Data 04/05/05

Cardiac/HTN Clinic	66
Diabetic Clinic	2
Disability Clinic	42
Endocrine Disorder Clinic	28
Gastrointestinal Clinic	37
Generic Clinic	0
Hep C Clinic	20
Infectious Disease Clinic	15
Neurologic Disorder Clinic	14
Pulmonary Clinic	<u>68</u>
All CCCs	292

(Tr. 264; Pls.’ Ex. 37 at 29.)

123. Fifty prisoners identified at Egeler had respiratory conditions that could put them at risk in a fire. That is about the same percentage as shown in national studies. (Tr. 264-65.)

124. After eliminating duplicates resulting from prisoners who had more than one problem in exiting, Ms. Ferguson identified 199 prisoners, or fourteen (14%) percent of the population at Egeler, who are at significantly elevated risk of harm in a fire or emergency evacuation in comparison to the norm. (*Id.* at 265.)

125. Of the 199 prisoners, 144 would need extra time to travel across the gallery, down the steps, and out the doors. (Tr. 268.)

126. There are prisoners in wheelchairs confined in Block 1. (Pls.’ Ex. 3B at 11.)

3. POTENTIAL IMPAIRMENTS TO FIRE PROTECTION AND EGRESS

127. Prisoners with physical problems, including orthopedic problems, neurological problems, cardiac problems, pulmonary problems, diabetics, persons with HIV, the mentally ill,

and persons with communicative disabilities or lack of English would have particular difficulties in evacuating the cellblocks. (Pls.' Ex. 3B at 25-26.)

128. Prisoners at a reception center are entering very unfamiliar surroundings, and can be bewildered and uncertain. (Tr. 219.)

129. Staff report that there are not enough base level cells available for prisoners who require such housing for health reasons, and that it can take a month or more for a prisoner with a medical need for base level housing to be moved to base from another gallery. (Pls.' Ex. 3B at 13.)

130. Defendants estimate that approximately six prisoners for whom English is a second language go through the classification process each month. (Pls.' Ex. 46 at 8.)

131. Prisoners going through the reception process at Egeler sometimes do not understand that they are expected to open the door to their cell when they hear the fire alarm, *i.e.* they wait for the doors to be opened. (Pls.' Ex. 21A at 034.)

B. PARNALL

1. CLASSIFICATION

132. Prisoners in Parnall are classified as Level I, the lowest level of custody. (Tr. 95.)

133. The prisoners in Block 8 are considered general population prisoners even if they are enrolled in a chronic care clinic. (*Id.* at 243.)

134. Their cell doors are open most of the day. (*Id.* at 92.)

135. The prisoners leave their cells and the block for the cafeteria, job assignments, law library, health care, visits and yard recreation.

2. HEALTH CHARACTERISTICS

136. In Block 8, Dr. Walden identified 58 prisoners who were likely to be at heightened risk during a fire but were not housed on the ground level. (Pls.' Ex. 3B at 68-80; *see also* Pls.' Exs. 38, 40; Pls.' Proposed Findings, Attach. B.)

137. The prisoners identified included ten housed on fourth gallery and 15 housed on third gallery. (Pls.' Ex. 3B at 68-80; *see also* Pls.' Exs. 38 & 40.)

138. The great majority of the 58 prisoners identified by Dr. Walden had been diagnosed with either respiratory or cardiac disease, or both. In the majority of cases, these prisoners carried additional diagnoses. Among the prisoners identified were 124266, with lumbar disc displacement and pelvic displacement, noted by Defendants to have an orthopedic deformity classified as requiring assistance; 135363, also with an orthopedic deformity classified as requiring assistance, in addition to diabetes, respiratory disease, limitations on lifting, and HIV infection; 147207, with cardiac disease classified as requiring assistance among other diagnoses; 157121, with cardiac and respiratory disease, noted to require permanent air conditioning among his unusual accommodations; 164755, with both visual and hearing impairments classified as requiring assistance; 166484, with cardiac disease classified as rendering him disabled, yet is housed on Second Gallery; 166760, with both cardiac disease and chronic airway obstruction (emphysema), as well as a visual impairment classified as requiring assistance; 265113, with glaucoma and a hearing impairment classified as requiring assistance, who is noted as having communication difficulties, yet is housed on Fourth Gallery; 303611, with cardiac disease classified as requiring assistance as well as diabetes and obesity; 368151, with acquired traumatic brain injury and visual impairment classified as requiring assistance but is housed on Third Gallery; 466500, with an

orthopedic deformity, cardiac disease and respiratory disease, as well as a visual impairment classified as requiring assistance yet is housed on Fourth Gallery. Prisoner 516312, identified by Dr. Walden, would be attempting to descend stairs with the help of crutches or a cane. Pursuant to Defendants' health care policy, he should have a medical order for base level housing but apparently does not. He is housed on Fourth Gallery. Further, Prisoners 127748 (Third Gallery), 135363 and 271651 (Third Gallery), 316603 and 423321 (Fourth Gallery), 466500 (Fourth Gallery), and 516312 (First Gallery) have medical orders for base housing but are not housed on the base level. (Pls.' Ex. 3B at 69, 71-74,77, 80.)

139. Ms. Ferguson applied the same analytic methods she used in Egeler to Block 8 of the Parnall Facility (Pls.' Ex. 40). Her findings are summarized in a table of 174 data entries identifying prisoners who would have difficulty with mobility, breathing, strength and endurance, or following directions. (Pls.' Ex. 38; Tr. 265.)

140. There were 351 prisoners in Block 8 as of 2002; for all of Parnall, Blocks 8, 9 and 10, there were 1023 prisoners. (Pls.' Ex. 38 at 24.)

141. At least 30 of the 174 prisoners identified in Block 8 have respiratory conditions that impair their walking 100 yards or one flight of stairs, based on Defendants' health care criteria. Twenty-two of these prisoners were placed on First Gallery (the second floor) or above. (Pls.' Ex. 38 at 1; Tr. 266.)

142. At least 26 of the 174 prisoners identified in Block 8 have visual or hearing impairments that may interfere with their hearing or visually following directions. Defendants coded these 26 prisoners "LOF: A" (needs assistance). Twenty of these prisoners were placed on first gallery or above. (Pls.' Ex. 38 at 1; Tr. 266.)

143. Fifty-five of the 174 prisoners identified in Block 8 were on the base level. They will have difficulty exiting for the very reasons they have been placed on base. (Pls.' Ex. 38 at 1.)

144. One Hundred Twelve of the 174 prisoners identified in Block 8 are listed as at risk for heat-related illness. (Pls.' Ex. 38 at 1.)

145. Ten of the 174 prisoners identified in Block 8 have asthma or chronic airway obstruction, but are not listed on the HC-251 with respiratory disease, and were placed on First Gallery or above. (Pls.' Ex. 38 at 1.)

146. Seven of the 174 prisoners identified in Block 8 are noted as "placement mistakes" in the Table "comments" column. Staff had identified these prisoners in the HC-251 as in need of ground floor housing, but they were housed at some other level by custody staff. (Pls.' Ex. 38 at 1; Tr. 266.)

147. Sixty-five percent of the total Parnall population are enrolled in chronic care clinics and nearly half of them are either in the cardiac or pulmonary chronic care clinic. (Tr. 266; Pls.' Ex. 38 at 24.)

148. There are 663 prisoners at Parnall who are enrolled in a chronic care clinic, as follows (Pls.' Ex. 38 at 24; Pls.' Ex. 40B.) :

Parnall Chronic Care Clinic Enrollment Data 04/05/05

Cardiac/HTN Clinic	222
Diabetic Clinic	1
Disability Clinic	49
Endocrine Disorder Clinic	112
Gastrointestinal Clinic	59
Generic Clinic	9
Hep C Clinic	65
Infectious Disease Clinic	33
Neurologic Disorder Clinic	28
Pulmonary Clinic	<u>88</u>
All CCCs	663

149. Forty of the 174 prisoners identified in Block 8 have respiratory conditions that would put them at risk, more than double the percentage in national studies. (Pls.' Ex. 38 at 1; Tr. 266.)

150. After eliminating duplicates resulting from prisoners who had more than one problem in exiting, Ms. Ferguson identified 160 prisoners in Block 8 as having conditions that could lead to difficulties in exiting and are at significant risk of harm in fire or emergency evacuation. That figure is 46 percent of the prisoners in Block 8. (Tr. 267; Pls.' Ex. 38.)

151. Of those 160 prisoners in Block 8, 103 would require extra time to travel along the galleries, down the steps and out the doors. (Tr. 268.)

152. In Block 8, prisoners who are identified as being at risk of heat-related illness are asked to sign written waivers in order to maintain their housing assignments. (Pls.' Ex. 36.) A typical waiver (Pls.' Ex. 36A-1) reads as follows:

You have been identified as being at risk of heat related illness. As such, an effort will be made to house you on the Base or First Gallery. If necessary, you may be moved to another housing unit to accommodate a low cell placement.

If you believe it is not necessary for you to be placed on a lower gallery and would like to remain in your currently assigned cell, you may sign in the indicated position below.

I choose to remain in my currently assigned cell.

153. Ms. Ferguson performed a comparison of the prisoners in Block 8 who signed such cell placement waivers in the year 2004 (Pls.' Ex. 36A-1) to their health data reported in the HC-251s (Pls.' Ex. 36A-2) and HC-261s (Pls.' Exs. 36A-3, 36A-4). The results are shown in a table of 36 prisoners. (Pls.' Ex. 36A; Tr. 267.)

154. Thirty-six cell placement waivers were signed by Block 8 prisoners in the months from May to September, 2004. (Pls.' Ex. 36A at 1.)

155. Each of the 36 prisoners who signed cell placement waivers in 2004 was still at the Parnall Facility as of November 2, 2004. (Pls.' Ex. 36A at 1.)

156. Six of the 36 prisoners who signed cell placement waivers in 2004 have respiratory conditions that impair their walking 100 yards or one flight of stairs. (Pls.' Ex. 36A at 1.)

157. Seven of the 36 prisoners who signed cell placement waivers in 2004 have visual or hearing impairments that may interfere with their hearing or visually following directions. All seven are coded "A" (needs assistance). (Pls.' Ex. 36A at 1.)

158. Nine of the 36 prisoners who signed cell placement waivers in 2004 are listed as at risk for heat-related illness and have no description of a disability on the HC-251, but are enrolled in a clinic on the HC-261. Of these, six are in the cardiac chronic care clinic. (Pls.' Ex. 36A at 1.)

159. Ms. Ferguson performed a similar analysis for 42 prisoners who were asked to sign cell placement waivers in Block 8 in April 2005. This analysis was combined with the corresponding analysis for 2004 to provide a comprehensive table. (Pls.' Ex. 36B; Tr. 267.)

160. Of the prisoners in Block 8 who signed cell placement waivers in 2004 or 2005, 55 were in Block 8 in April 2005. Seven prisoners from Exhibit 36A are not listed on the HC-251 for April 2005. One prisoner from Exhibit 36A (175733) moved to a cell on First Gallery. One prisoner (224533) is listed on Fourth Gallery in an April 2005 report, but no signed waiver was provided by Defendants. (Pls.' Ex. 36B at 1; Defs.' Ex. 28.)

161. Of those prisoners in Block 8 in April 2005 who signed waivers, seven have respiratory conditions that impair their walking 100 yards or one flight of stairs. (Pls.' Ex. 36B at 1.)

162. Of those prisoners in Block 8 in April 2005 who signed waivers, nine have visual or hearing impairments that may interfere with their hearing or visually following directions. These nine prisoners are coded "A" (needs assistance). (Pls.' Ex. 36B at 1.)

163. Fourteen prisoners in the combined group who signed cell placement waivers in 2004 and 2005 are listed as at risk for heat-related illness and have no description of disability on the HC-251. Six of these are enrolled in the Cardiac Chronic Care Clinic, and three are not listed in any chronic care clinic. (Pls.' Ex. 36B at 1.)

164. In view of the risks to these prisoners and others in a fire or an emergency evacuation, Ms. Ferguson recommended that these prisoners should not be asked to sign a waiver of this medical accommodation. (Tr. 268; Pls.' Ex. 36.)

165. Exiting down five stories utilizing open stairways is not safe, particularly in a fire under smokey conditions with floors possibly wet and slippery from sprinklers. (2002 Findings ¶ 1290.)

166. Given that in Parnall 60 percent of the population have serious health problems, there are a number of prisoners who will take their time going down stairs. The stairs would be the only means of evacuation. Because stairs will be the only means to reach an exit, a panic would likely ensue in the event of a serious fire. This is a potentially life-threatening situation. (Tr. 232-33.)

167. If there were a fire, a cell door that would not open would pose a life-threatening situation to the prisoner in the cell, particularly for a prisoner with health problems. (Tr. 232.)

168. An advantage of constructing a smoke compartment is that it would address the security staff's hesitancy (*i.e.*, to avoid security risks and dangers of riot) to releasing prisoners from a prison block during an emergency. If there is an exit to an adjacent smoke compartment, the option to evacuate is more likely to be used. (Tr. 321-22.)

169. Sixty percent of prisoners in Block 8 are enrolled in a chronic care clinic, a rate of disease that is radically higher than the rate one would expect in the general population. (Pls.' Ex. 3B at 83.)

170. For a period of time shortly before hearing, there was a prisoner in Block 8 confined to a wheelchair. At the time of hearing, Block 8 housed a prisoner on crutches. (Tr. 117.)

171. As of May 5, 2005, there were no prisoners in a wheelchair housed in Cell Block 8. (Tr. 86.)

172. Parnall is not designated as a wheel chair accessible facility. (Tr. 118.)

173. Everyone on the base level in Block 8 has a physical limitation that requires their housing at that level. (Tr. 80.)

174. A prisoner in general population, even if identified on the HC-251 and/or HC-261 as being in a chronic care clinic, is generally able to walk to the cafeteria, to the prison store, to classes, to a job assignment, and otherwise function while incarcerated. (Tr. 244.)

3. POTENTIAL IMPAIRMENTS TO FIRE PROTECTION AND EGRESS

175. The large number of prisoners with chronic diseases in Parnall results in significant and unusually high numbers of persons who may be unable to evacuate from the cellblock at a

normal speed, and whose difficulties might also impair the evacuation of other prisoners. (Pls.' Ex. 3B at 25-26; Tr. 256.)

V. OPERATIONAL AND PHYSICAL CHARACTERISTICS, INCLUDING FIRE SAFETY PROVISIONS

A. RISK FACTORS AND CONDITIONS

176. According to Defendants' evacuation diagram of the base level of Block 7, if prisoners evacuate from the mid-point of Fourth Gallery and travel in opposite directions, they must travel 246 feet to the farthest exit. (Pls.' Ex. 27 at 006.)

177. According to Defendants' evacuation diagram of Fourth Gallery of Block 8, if prisoners in Block 8 evacuate from the midpoint of Fourth Gallery of the block and travel in opposite directions, they must travel 258 feet to the farthest exit. (Pls.' Ex. 27 at 008.)

178. The total distance a prisoner must travel to exit is over 200 feet in all cellblocks. (Tr. 193.)

179. There are only two officers in each side of the housing units during the night shift, which places the population at extreme risk in a serious fire situation. The staffing level on the night shift has been reduced from three to two per side of the cellblock. (Tr. 221-22.) However, there may be additional staff who could respond to fire emergencies from other cell blocks and the control center.

180. Prisoners are at greatest risk at night when they must be awakened before they can be evacuated. (Tr. 222.)

181. Defendants' staff admitted that a fire at night would result in a longer evacuation time because those in need of evacuation would be sleepy. (Tr. 69.)

182. On the night shift, the Resident Unit Manager and other non-custody staff are not likely to be in the housing unit. (Tr. 73.)

183. Even though some support staff can assist in the event of a fire emergency, to do so they must travel substantial distances, between 600-800 feet, to the facility. Back-up staff would have to travel to the control center to get extra emergency keys and then return a distance of 600-800 feet to assist in opening cells. (Tr. 222, 224; *see also* Pls.' Exs. 25 & 26.) The time involved to obtain the keys may be from one to three minutes, and the time required to manually unlock all cells may be about two minutes per side. (*Id.*)

184. When prisoners arrive on base during an evacuation in Egeler, staff must open doors to let them out into the yard. (Tr. 226.)

185. There is not enough room to pass another person on the stairs in Block 7. (Pls.' Ex. 3B at 16-17, 19.)

186. There is also not enough room to pass another person on the stairs or the pinch points in Block 8. (Pls.' Ex. 3B at 16-17, 19.) It would be difficult to exit if someone were attempting to climb the stairs during exiting. (Tr. 98.)

187. The risks are not limited to the persons with a disability or other problem. If one of these prisoners fell, or had a condition that caused him to move more slowly than others, then other prisoners would be placed at increased risk of harm. (Tr. 256; *see also* Pls.' Ex. 3B at 145.) However, this has not been a problem during fire drills and past evacuations.

188. The stairs in all the cellblocks lack non-skid coverings and feel somewhat slippery. This is especially true of Block 1. (Pls.' Ex. 3B at 9.)

189. The floor near the shower in Block 2 was, upon inspection, wet and slippery. If and when the sprinklers would go off, the water on the floor would be very slippery. The floors had similar composition in each of the housing units. (Tr. 251, 253.)

190. The gallery in Block 7 feels slippery, even when dry. (Pls.' Ex. 3B at 16.)

191. The terrazzo floor in Block 7 is highly polished and a bit slippery. About a third of the open space in the atrium in Block 7 is occupied by square tables set at an angle that are bolted to the floor. There are about ten feet of unencumbered space on each side of the tables. (Pls.' Ex. 3B at 14.)

192. Prisoners in Egeler undergoing the reception process are allowed to keep their personal legal property, which includes books, pleadings, documents and correspondence. Qualifying legal property is permitted without limitations in amount. In addition, prisoners in Egeler for reception processing are allowed religious items other than reading material, personal addresses, prescription glasses and medically necessary items. (Pls.' Ex. 6 at 2; Pls.' Ex. 19 at 3-4.) However, according to prison staff, prisoners in Egeler usually have minimal personal property with them during their residence at Egeler.

193. A number of prisoners at Egeler receive medical accommodations that would increase the fuel available in a fire. These accommodations⁷ include the following: cotton blanket (133045); cotton blanket (136057); mattress (136169); cotton blanket (152363); non-wool blanket (168576); extra sheet (190524); extra sheet (197090); extra pillow (200156); extra bedding (unspecified) (207303); extra sheet (220836); cotton blanket (231840); extra pillow (233507); sheets (234899); cotton blanket (245575); sheet (249428); extra pillow (257849); sheet (266171);

⁷ The numbers listed identify prisoners receiving the accommodations.

cotton blanket (269530); sheet (271373); extra bedding (unspecified) (341839); sheet (361175); sheet (380243); blanket (449279); sheet (494020); and extra sheet (510124). (Pls.' Ex. 39A.)

194. At the time of Plaintiffs' expert tour on March 18, 2005, there was a pile of laundry in a laundry bin near the laundry room in Block 8. The laundry pile was approximately three feet by six feet by four feet. (Pls.' Ex. 3B at 19-20.)

B. FIRE PROTECTION AND ALARM SYSTEMS

195. The MDOC's policy on fire safety and Operating Procedures on Fire Control and Emergency Evacuation and Fire Department Response, Defendants' Exhibits 4-9, outline the physical plant requirements and staff operational requirements.

196. MDOC policy requires that Mr. Fushi conduct annual inspections of the correctional facilities, including the housing units. (Tr. 16.) The last inspection of Egeler was in November 2004 and Parnall in May 2005. (*Id.*)

197. During his inspections, Mr. Fushi looks for any possible violations of the Life Safety Code and any changes that might negatively affect the fire safety and operation of the facility. (*Id.* at 17.) He also examines the facility to ensure its compliance with MDOC fire safety policy, both operationally and administratively. (*Id.*)

198. Each sprinkler head activates individually. The sprinkler head is designed to activate when its heat sensor is exposed to a temperature of 135-265° Fahrenheit. (Pls.' Ex. 3B at 12-13.)

199. In a fire in December 2004 that resulted in prisoner and staff injuries, the prisoner tampered with the sprinkler, and it did not activate. (Pls.' Ex. 33A-8.) However, that fire still did

not spread to other cells and other than the prisoner who set the fire in his cell, there were no other prisoner injuries related to the fire.

200. It is not difficult to incapacitate a sprinkler. (Tr. 308.)

201. Recent fires in the cellblocks were not discovered by smoke detectors. The detectors may not always actually function in a manner that contributes to fire safety. (*See* Pls.' Ex. 33A-2 at 006, 010, 012; Tr. 89, 341-43; Pls.' Ex. 33B-1.) In one case, the fire was extinguished before enough smoke developed to set off the detectors.

202. Dr. DiMascio believes that a sprinkler in a cell where a fire has been set by a prisoner will resolve the problem if the sprinkler has not been compromised. (*Id.* at 308.) He also testified that it is not difficult to compromise a sprinkler, and that anyone with a working knowledge of a sprinkler could do so. (Tr. 303.)

203. In the case where the ceiling temperature in the cell above the cell fire reaches 175 degrees, the sprinkler (if operational and not compromised) would be triggered. (*Id.* at 318.)

C. UNLOCKING MECHANISMS

204. Within 8 Block, when the locks are working, there are three ways of unlocking the cells: 1) electronic release at the end of each gallery; 2) manual release at the end of each gallery; and 3) remote electronic release from a distant control center. (*Id.* at 62.)

205. The release mechanisms in Cell Blocks 1, 2 and 3 are all manual except for the gallery gates. (*Id.* at 69.) Cell doors in Blocks 1, 2 and 3 do not open automatically or electronically. The only electronic release operates on expanded metal gates at the end of each gallery. These doors are electronically opened from the control center only. A key lock is also

provided on the end doors of each gallery with every officer having a key to open the doors manually in case of electronic failure. (Pls.' Ex. 28; *see also* Pls.' Ex. 46 at 9-10.)

206. The custody staff often have keys to unlock the cell blocks. (*Id.* at 71.) The "emergency keys" located in the control center are for the fire department. (*Id.*)

207. The gates at the end of the galleries are no longer locked or lockable in 8 Block. (*Id.* at 95-96.) The gates remain open all the time. (*Id.*)

208. Dr. Walden accepted a 7 Block officer's explanation that it was quicker to manually release the prisoners from their cells than it was to use the remote electronic gang release. He also stated that in the event of a major fire, however, conditions in the cellblocks would rapidly deteriorate to the degree that staff would be unlikely to be able to unlock all cells manually. (Walden Dep. 90.)

209. There are 20 breaker boxes in each cellblock in Blocks 1-3. These breaker boxes must be operated to unlock all the cells. Two of the breaker boxes are on each of the five levels on each side. Within each box, a breaker bar must be attached and then turned manually to open half the cells on that side of that level. (Tr. 223-24.)

210. The cell doors in Blocks 1-3 are opened in an emergency by a manual gang release at the end of each gallery. Each manual gang release breaker will open one-half of a gallery. Cell doors can also be opened manually by using a cell key to open each door one at a time. (Pls.' Ex. 28; *see also* Pls.' Ex. 46 at 9-10.)

211. Staff in Block 1 indicated that using the breaker bar to open the locks on each gallery individually might work as well or better than having the gallery locks opened from the control center. (Pls.' Ex. 3B at 11-12.)

212. A fire drill report for Block 3 dated October 5, 2004 notes the following: “Several prisoners did not open their cell doors when brakes were thrown so had to be keyed out by the SCBA [self-contained breathing apparatus] teams. It appears that newer prisoners did not know if this was a fire drill or al[a]rm was for lockdown.” (Pls.’ Ex. 21A at 034.)

213. The usual process for opening cells doors in each of Blocks 1, 2 and 3 requires opening twenty separate breaker boxes on the galleries. The same process is required in Blocks 7 and 8. In Blocks 7 and 8, there are also electronic release mechanisms in a control center in a separate building that can open cell doors one at a time, or by sections. (Pls.’ Ex. 28; *see also* Pls.’ Ex. 46 at 9-10.)

214. Blocks 7 and 8 also resemble Blocks 1, 2 and 3 in having breaker box release systems that must be opened at 20 separate locations. In Blocks 7 and 8, however, there is a back-up remote control release system. (Tr. 223.)

215. If manual release is necessary in Block 7 or 8, a lever in the control box at the end of each gallery must first be thrown to switch the electric release system off. A manual release lever must then be thrown at the end of each gallery to open a group of cell doors at a time. Individual cells can also be opened manually by using a “T” handle bar located in each control box. (Pls.’ Ex. 28; *see also* Pls.’ Ex. 46 at 9-10.)

216. The group override unlocking mechanism in Block 8 does not work when the cells are placed on the “closed mode;” even if it worked, it is potentially unsafe to have the only remote release system outside the block, given the delay in accessing the system. (Pls.’ Ex. 26 at 004.)

217. Neither the quarantine cells nor the cells for the disabled can be operated by the breaker bar system, but must be individually unlocked. (Tr. 223.)

218. The locking mechanisms frequently break down and fail to open cell doors and other cellblock locks. These lock failures involve both the doors of individual cells and locking mechanisms for groups of cells. (*See generally* Pls.' Ex. 32.)

219. Between January 1, 2004 and November 18, 2004, there were 18 locking mechanism failures affecting one or more cells in Block 1. At least two of these failures affected groups of cells. One of these failures was not repaired for 89 days. (Pls.' Ex. 32 at 1; Pls.' Ex. 30.)

220. Between January and November 2004 in Block 1 North, ten percent of all the locks were out of service, some for as long as two months; in Block 2 North, approximately 15 percent of all the locks were out of service. (Tr. 231-32; Pls.' Ex. 30.)

221. Between January 1, 2004 and November 18, 2004, there were 39 locking mechanism failures affecting one or more cells in Block 2. At least 13 of these failures affected groups of cells. One of these failures was not repaired for 80 days. (Pls.' Ex. 32 at 1-2; Pls.' Ex. 30.) Defendants represent that these failures involve locks that fail to lock, and that there are no records of prisoners being locked in their cells and unable to be released.

222. Between January 1, 2004 and November 18, 2004, there were 49 locking mechanism failures affecting one or more cells in Block 3. Eighteen of these failures affected groups of cells. One of these failures was not repaired for 79 days. An outside door that would not unlock was not repaired for ten days. Three locking mechanisms affecting groups of cells were not repaired for over a month. (Pls.' Ex. 32 at 2-3; Pls.' Ex. 30.) Defendants represent that these failures involve locks that fail to lock, and that there are no records of prisoners being locked in their cells and unable to be released.

223. Defendants' lock repair records for Block 7 are incomplete and contain too little information to evaluate. (*Compare* Pls.' Ex. 30 at 15-17 to Pls.' Ex. 30 at 1-14.) Moreover, Defendants' fire drill records for Block 7 contain notes indicating that two locking mechanism failures were discovered during fire drills, but there is no entry in Defendants' lock repair records indicating that any locking problem was reported on the date of the fire drills, or shortly following that date. (*Compare* Pls.' Ex. 21A at 011, 021 to Pls.' Ex. 30 at 15-17.) Therefore, a preponderance of the evidence suggests that Block 7 experiences locking mechanism problems at a rate similar to that of the other cellblocks.

224. In the period January 1, 2004 to February 23, 2004, there were 22 locking mechanism failures affecting one or more cell in Block 8. Four of these failures affected groups of cells, and one failure affected all cells. One of these failures was not repaired for 103 days. (Pls.' Exs. 32 at 4; Pls.' Ex. 29.)

225. The severe problems with the locking systems are not new. A substantial number of the cell locking mechanisms did not work in 2002. (2002 Findings ¶ 1385.)

226. Curtis Pulitzer testified that in his experience, he has never seen a locking system as badly deteriorated as the system in Blocks 1-3 that was not replaced as a matter of course. (Tr. 232.)

D. FIRE DRILLS AND SIGNAGE

227. Fire drills are important to familiarize both staff and prisoners with the process of evacuation in a threatening situation. (*Id.* at 229-30.)

228. Only mock drills are conducted at night when there are the fewest number of staff. (*Id.* at 229.)

229. Mr. Fushi recently made recommendations regarding changes to the Egeler Facility's operation of fire drills to provide greater consistency between shifts. (*Id.*)

230. Mr. Fushi opined that fire drills should be varied. (*Id.* at 18.) Ideally, during drills, you would start in the middle of the cell block and evacuate away from the center of the block. (*Id.*) However, the recommended approach is to practice alternative ways to evacuate. (*Id.*)

231. Mr. Fushi recommended revisions of all the evacuation diagrams in the cell blocks to better inform staff and prisoners. (*Id.* at 18-19.)

232. There is a fire drill report that is prepared after each fire drill. (*Id.*; Defs.' Exs. 10 & 11.)

233. MDOC reports do not identify which fire drills involve actual prisoner evacuation. (Tr. 28-29.) To determine whether a particular drill involved actual prisoner evacuation, the log book would have to be examined. (*Id.* at 28.) It is also impossible to tell from the fire drill reports how many prisoners were in the housing unit at the time of the drill. (*Id.* at 206.) Likewise, one cannot discern from a drill report the number of prisoners housed in quarantine cells at the time of the drill. (*Id.* at 28-29.)

234. Necessary qualitative operational information is not contained in the evacuation reports other than a fire drill happened in a particular block. (Tr. 229.)

235. Since no drills are being done at night, the validity of the times shown in the reports in comparison to the time an actual evacuation would take is very questionable. (Tr. 230-31.) There are also conflicting interpretations of what the evacuation times recorded in the fire drills refer to, which make such times suspect. (*Id.* at 228-29.)

236. In the Egeler Facility, given the turnover rate, the fact that a fire drill is done quarterly on each shift, and that 1,000 prisoners are coming into the facility per month, it is likely that many prisoners will never have participated in a fire drill. (*Id.* at 229-30.)

237. Defendants' Exhibit 11 reflects fire evacuation drill reports involving staff only without actual prisoner evacuation. (*Id.* at 20-22.) The purpose of this drill is to ensure the training of staff on third shift (10:00 p.m. – 6:00 a.m.) without having to evacuate the prisoners at night. (*Id.*)

238. During third shift staff drills, the staff walk through the evacuation procedure and conduct simulated fire drills. (*Id.*) The purpose of drills is to train officers and staff on the procedures to be followed in case of fire. (*Id.*) The third shift officers actually go through the procedures and simulate all their responsibilities.

239. The MDOC's Policy Directive and Operating Procedures do not mandate any particular time to evacuate during a fire drill. (*Id.*) Likewise, the Life Safety Code does not mandate any particular time for evacuation. (*Id.*)

240. Fire inspectors who do monthly inspections of the facilities, review the evacuation reports, and Mr. Fushi reviews the reports on an annual basis. (*Id.* at 30.)

241. The range of elapsed times for evacuations set forth in Defendants' Exhibit 10 is 5-20 minutes. (*Id.*)

242. Defendants represent that the evacuation diagrams within the cell blocks have been corrected since the tour in March 2005. (*Id.* at 68.) In an actual emergency, direction will be provided by MDOC staff. (*Id.* at 68-69.)

243. When a fire drill takes place in a housing unit, all staff in the housing unit, including non-custody staff, are expected to be involved. (*Id.* at 72.) Custody staff in the housing unit are the first responders, but custody staff from other blocks are also used. (*Id.*)

244. The MDOC requires facilities to conduct one fire drill per shift per quarter. (*Id.* at 74.) Each resident unit manager independently schedules the times of the drills. (*Id.*)

245. RUO Meeker has never observed prisoners getting “caught” or blocked in an exit or a stairwell during a fire drill. (*Id.*)

246. ARUS Embry has been in 8-Block during fire drills and also a fire incident. (*Id.*)

247. ARUS Embry has never observed prisoners experience foot traffic congestion along the gallery walkways or stairways during a fire drill. He also stated that prisoners “take their time” during a fire drill. (*Id.* at 97.)

248. During a fire drill, the first prisoners evacuated are on Base level. (*Id.*) An exception is the quarantine cells in Block 1 that are normally not evacuated in fire drills. The situation varies in the event of an actual fire incident. (*Id.*)

249. Prisoner aides assist to evacuate disabled prisoners, which aides are assigned to particular prisoners. (*Id.* at 101.) While ARUS Embry has never observed a prisoner aide not doing his job during a fire drill, *id.*, this assistant would be unreliable in the event of an actual fire. (Tr. 226-27; *see also* Pls.’ Ex. 12 at 7.)

250. Custody staff are expected to personally check to make sure every cell has been evacuated during an evacuation drill. (*Id.* at 102.)

251. Variation in fire drill times in a prison is expected. (*Id.* at 205.) Evacuation during a fire drill would not directly relate to the issue of evacuation during emergencies, since some of the fire incident reports indicate evacuation in five or seven minutes. (*Id.* at 205-06.)

252. A primary purpose of fire drills, as set forth by the codes, is to familiarize people with evacuation procedures in the event of an actual fire. (*Id.*)

253. Ronald Kovalski, a resident of Block 8, has participated in fire evacuation drills. He observed handicapped prisoners assisted by prisoner aides during the fire drill. (*Id.* at 347.) Kovalski has never observed anyone being injured in the stairways during a fire drill, but did observe prisoners slip and fall on the stairs on Block 8. (Tr. 348.)

1. BLOCK 1

254. Fire drills in Block 1 have taken up to 16 minutes to complete. (Pls.' Ex. 21A at 033.) Fire drills in Block 1 use only one exit, although in an actual fire, staff and prisoners would be expected to use an additional exit. (Pls.' Ex. 3B at 6-7.) During a routine fire drill, the prisoners in the Block 1 south quarantine area are not released from the block. (Tr. 110.)

255. Diagrams for evacuation routes in Blocks 1 and 2 of the Egeler Facility indicate that prisoners are to travel the entire length of their gallery to exit. (*See* Pls.' Ex. 27 at 002, 003.) As of March 18, 2005, the posted evacuation signs in Block 1 were upside down, so that it was difficult to determine where the reader was. (Pls.' Ex. 3B at 4, 6; Tr. 250.)

256. In addition, the evacuation drawing posted on the south side of Block 1 indicated that prisoners were to evacuate in the opposite direction from the direction indicated in the evacuation sign posted on the north side, which was confusing. (Pls.' Ex. 3B at 9.) Mr. Fushi

testified at hearing that the cell block diagrams have been re-drafted to correctly describe exit routes.⁸

2. BLOCK 2

257. Fire drills in Block 2 have taken up to 15 minutes to complete. (Pls.' Ex. 21A at 002.)

3. BLOCK 3

258. Fire drills in Block 3 have taken up to 20 minutes to complete. (Pls.' Ex. 21A at 025.) Staff outside Block 3 who are expected to respond in a fire drill do not always hear or respond to fire drills. (Pls.' Ex. 21A at 007, 019.)

4. BLOCK 7

259. Fire drills in Block 7 have taken up to 19 minutes to complete. (Pls.' Ex. 21A at 035.)

260. Although there are three exits in Block 7, fire drills are never practiced using two of the exits that might need to be used in the event of an actual fire. (Pls.' Ex. 3B at 15; Tr. 253.)

5. BLOCK 8

261. Fire drills in Block 8 have taken up to 20 minutes to complete. (Pls.' Ex. 21B at unnumbered page 3.)

262. Thomas Meeker, a Corrections Officer in Block 8, testified that fire drills are generally conducted by releasing prisoners starting on the base level. (Tr. 77.) ARUM Ronald

⁸Similar signage problems were observed as to the other cell blocks. However, Eugene Fushi testified that all of the posed drawings have since been corrected.

Embry confirmed that testimony. (*Id.* at 98-99.) Those drills do not involve practice on responding to different fire locations. (*Id.* at 77, 81-82, 87.)

263. MDOC policy provides that, after the area immediately at risk from fire is evacuated, fire evacuation should start at the top of the cellblock and start down. (Pls.' Ex. 10 at 7; Pls.' Ex. 14 at 10; Tr. 36-37, 255; Pls.' Ex. 3B at 11.)

264. Fire drills should not be routinely conducted in the same way. Because the location of a fire cannot be predicted, staff should practice alternative fire scenarios. (Tr. 18.) The best way to prepare for a real fire is to conduct fire drills in the way staff would be expected to perform in a real fire. (*Id.* at 99-100.)

265. Cell doors are not open in Block 8 during count or at night. Notwithstanding that fact, fire drills are conducted only when the cell doors are open. (*Id.* at 92-94.)

266. In Block 8, most of the time there are four officers and three supervisors involved in a fire drill. (*Id.* at 99.) In contrast, if a fire occurred at night time in Blocks 1-3 or Block 8, only two officers would be in the cellblock. (Pls.' Ex. 46 at 1-2.)

E. OPERATIONAL POLICIES

267. An actual fire incident will generate a critical incident report, written testimony of the personnel involved, and a fire incident report. (Tr. 31-32; Def.s' Exs. 12a-20c.) It may also include an investigation report by the Michigan State Police. (Tr. 32.)

268. The MDOC's policy does not require the evacuation of the prisoner population in a cell block whenever a fire incident within a cell block occurs. (*Id.* at 33.) It is better to evaluate and only evacuate the necessary prisoners that you have to during a fire, since many of the fires are

very small. (*Id.*) Also, unnecessary prisoner evacuations may jeopardize the security of an entire cell block. (*Id.*) How to make evacuation decisions is a part of staff training. (*Id.* at 33.)

269. Mr. Fushi has the authority to make recommendations regarding fire safety operational changes. (*Id.* at 40.) He has made recommendations concerning the response of the SCBA team. (*Id.*) Evacuation is one response to a fire, and fire suppression is a totally separate response. (*Id.* at 42.)

270. The local fire department, Blackman Township, is two or three miles away and can respond to a fire emergency. (*Id.* at 15.) During the MSI Laundry fire in October 2003, the actual time between notification and arrival of the fire department was 15 minutes. (Defs.' Ex. 19b.) The Blackman Township fire department is invited to participate in an annual "pre-fire plan" with the facilities to review equipment changes and refresh on procedures in the prison for getting in to respond to a fire. (*Id.* at 15-16.)

271. Policy provides that fire emergency keys used to unlock exit and egress doors have a rivet attached so they can be identified by feel and sight. (Defs.' Ex. 5.)

272. Egeler and Parnall facility operating procedures require staff from the control center and other parts of the facility not involved in a fire incident to respond to a housing unit where there is a fire incident. (Defs.' Exs. 6 & 8.)

273. In Block 7, there is a laundry exchange where prisoners will drop their linen in tubs and pick up new linen. (Tr. 107.) The tubs are rotated between the cell block and quartermaster building; these tubs are removed before the end of second shift and are not in the cell block overnight. (*Id.* at 108.)

274. Staffing policies applicable to Blocks 1, 2, 3 and 8 assign only two correctional officers to each entire cellblock during the night shift. (Pls.' Ex. 46 at 1-2.) Staff have no practice in attempting an actual evacuation of a block with only two officers; fire drills in Block 8 involving actual evacuation typically have involved four officers and three supervisors. (Tr. 99.)

275. Policy requires that, in an evacuation at Egeler, one staff member is to open the cells and the other is to walk the galleries to see if prisoners have evacuated. (Pls.' Ex. 12 at 7.) Two officers, however, are required just to open the cells. (Tr. 225.) There are a total of four staff who could assist the two officers on the 10-6 shift in Block 7. (See Pls.' Ex. 24 at 001; Pls.' Ex. 47.)

276. There is no SCBA (self-contained breathing) equipment in the Block 8 housing unit. This equipment allows rescue of persons trapped as a result of fire and smoke. (See Pls.' Ex. 47; Pls.' Ex. 10 at 5, ¶ 23.)

277. Only mock drills are conducted at night, when there are the fewest number of staff. (Tr. at 229.) The drills are inadequate to prepare for a real fire emergency, particularly in light of the limited staffing on the night shift. (Tr. 221.)

278. Policy requires that the Prisoner Guidebook is to include training in the event of a fire. The Guidebook contains one paragraph of instructions which is limited to informing prisoners to learn the posted evacuation routes, listen to instructions, and crawl under the smoke to an exit. (See Pls.' Ex. 9 at 1; Pls.' Ex. 22 at 6.)

279. Good practice requires that the regional fire administrator or inspector make the decision regarding when fire drills occur. The fact that the RUM makes these decisions calls into the question the validity of the drills. (Tr. 234.)

F. STAFF PERFORMANCE

280. Parnall Operating Procedure requires that in an evacuation cells are to be unlocked from the top of the block down. (*See* Pls.' Ex. 10 at 7.) Defendants' staff do not follow this policy. (Tr. 77, 98-99.)

281. The Operating Procedures at Egeler, Pls.' Ex. 12 at 2, require that the cells occupied by disabled prisoners be specially identified with a blue card as follows:

Handicapped prisoners are located within Housing Units, 1, 2, and 3, C-Unit and Duane Waters Hospital (DWH). The handicapped prisoners are identified by a blue card at the master count board in the housing unit and also by a 1"x1" blue card with an "H" stamped on it attached to the name tag on individual cells.

282. In Block 2, a number of frail prisoners were in cells that did not have blue tags. These included at least two crutch users, one prisoner using a cane, and one prisoner who was blind. (Tr. 250.)

283. The duties of the officers during the emergencies, such as dealing with a fire, could prevent them from assisting prisoners with disabilities who might need assistance because of visual or physical handicaps, or because that prisoner had become disoriented. Such delays would add risk for people with compromised respiratory systems. (Tr. 255.)

284. Prisoner helpers cannot always be relied upon in a fire situation, because the aides may be fending for themselves. (Tr. 226-27; *see also* Pls.' Ex. 12 at 7.)

285. Eugene Fushi has witnessed MDOC fire drills. (Tr. 23.) Since fire drills are a training exercise, they are not a surprise to staff; the drills commence with the sounding of the fire alarm or using the public address system. (*Id.* at 24.) Once a fire drill commences, all procedures

are to be simulated. (*Id.*) No later than 20 minutes before a fire drill, there is typically an announcement to prisoners that a fire drill will occur. (Tr. 346-47.)

286. It is RUO Meeker's experience that some prisoners do not evacuate during a fire drill; these prisoners exit when ordered by custody staff. (*Id.*)

287. Defendants' expert Carson is of the opinion that it is not important that everyone have the opportunity to practice in a drill to reduce or eliminate the risk of dying in a fire. (*Id.* at 206-07.) He believes that practice by custody staff is most important. (*Id.*) Carson examined Defendants' fire drill practices. (*Id.*)

288. Under Defendants' practices, any staff, including non-custody staff in a housing unit, are trained to respond to a fire emergency. This includes the RUM or the ARUS. (*Id.* at 72.) Yard staff, control room staff, and staff from other housing units are available to assist on-duty officers, including during the 10 p.m. to 6 a.m. shift. (*Id.*)

G. CONDITIONS DURING AN ACTUAL EVACUATION

289. In Egeler during an evacuation, two custody officers, one on each end, would have to climb the five levels to the top gallery. The officers would first be required to open the breaker bar boxes with a key. The boxes would be difficult to find in a smoky environment. After a breaker box was opened, the officer would begin to release the breaker bars. (*Id.* at 225.)

290. Because the cells in the Egeler Facility are arranged back-to-back, after a custody officer opened the cells on Fourth Gallery on one side, the officer would be required to cross over to the other side and open the breaker box there with a key, use the bar again to open the next group of cells, then go down the stairs and begin the process again on the next level. This process would continue until the officers reached the Base level and had opened all the cells. (*Id.* at 225.)

291. Fire safety dictates that people should not have to exit a building down smoke-filled stairs. (*Id.* at 314.) Defendants' expert agreed that if stairs are to be used for egress, they must be enclosed in a smoke-free compartment. (*Id.* at 142.)

292. While an atrium does serve as a reservoir for smoke, in order to accomplish evacuation, the smoke must be kept above the area used for egress. A smoke-removal system is necessary to keep smoke above the level of the evacuation route. (*Id.* at 313-14.) When a building becomes smoke-filled, due to the dangers of smoke inhalation, it is critical that persons be evacuated out of the exposure from smoke and hot gasses. (*Id.* at 317.)

VI. FIRE CODE COMPLIANCE

_____A. BUILDING AND FIRE PREVENTION CODES

293. Defendants' mechanical engineering expert David Sproul accepted the findings of Rosser Fabrap, the architecture and engineering firm retained by the State of Michigan, that:

. . . all of the cell blocks at Egeler violate the "means of egress" requirement of the [Building Officials Code Administrators] ("BOCA") Code; the stairs that would be used for evacuating the cell blocks in Egeler are inadequate in size, enclosure, location, and discharge; and the five-story mezzanine design in the Egeler cell blocks violates the atrium requirement in the BOCA Code. [2002 Findings ¶ 1296.]

294. The BOCA Code would not permit a five-tiered cellblock such as those at Egeler or Parnall. (2002 Findings ¶ 1393.)

295. The BOCA Code permits a ceiling height up to 23 feet as long as one of the exits does not require prisoners to descend stairs for more than 23 feet. The BOCA ceiling height requirement serves to reduce the number of people at risk. The intent of the ceiling height requirement is to assure compartmentalization, reducing the population at risk from a fire in a

particular unit and assuring that prisoners can move horizontally to the next unit in the event of fire, rather than being required to negotiate distances in excess of what is permitted by the Code. (2002 Findings ¶ 1399.)

B. LIFE SAFETY CODE AND ITS EQUIVALENCY

296. To assure reasonably fire safe housing units, Defendants must combine consideration of the needs of the population, adequacy of staffing, operating procedures for evacuation that are understood, and applicable fire codes. The totality of these factors must go into the planning and design of the *Hadix* facilities. (Tr. 221.)

297. Defendants stated in their State Prison of Southern Michigan Egress Report dated December 12, 2003, Pls.' Ex. 50 at 7, that:

Section 15-3.1.3 of the [Life Safety Code] allows multi-tiered open cell blocks to be considered a single story building if the cell block is provided with a smoke control system *and* the entire cell block is provided with fire protection.

298. Blocks 1-3 and 7-8 do not have a smoke control system as such a system is defined by the applicable codes. (2002 Findings ¶¶ 1404-05.)

299. The distance a prisoner must travel in 1-3 Blocks and 7-8 Blocks to exit the block exceeds the maximum travel distance of 150 feet permitted by the Life Safety Code. (*Id.* ¶ 1391.)

300. Chapter 15 of the LSC addresses existing detention facilities; it provides parameters for the life safety functions or physical requirements for existing prison facilities. (Tr. 130-31.) The LSC permits evaluation of an existing facility for equivalency, to determine if it meets the general overall requirements for life safety in Chapter 15 based on 13 different parameters developed in 1998. (Tr. 191; Defs.' Exs. 30a & 30b.) Passing the Life Safety Code does not necessarily equate with providing life safety for residents, and no one test can be used to determine

fire safety given the variety of structures and differing abilities of residents. (*See* ¶¶ 305 & 306 *infra*.)

301. The provisions of the Life Safety Code include a mechanism for assessing whether the fire safety provisions in a given facility are consistent with the level of safety required under the code, even if the facility does not in all respects comply with the code. (Tr. 138-39.) Equivalency was a method for developing a system for evaluating existing facilities for compliance with the level of fire safety intended by the LSC. (*Id.* at 191.)

302. The 13 equivalency parameters are: construction; hazardous areas; fire alarm; smoke detection; automatic sprinklers; interior finish (corridors and egress); interior finish (other areas); cell/sleeping room enclosure; separation of resident housing areas from other areas; exit system; exit access; vertical openings; and smoke control. (Defs.' Exs. 30a & 30b.) The form provided pursuant to the Life Safety Code equivalency provisions assigns a weighted score to each safety item listed in the form. (Tr. 134.)

303. A cell block passes the equivalency under the LSC if the number is positive at the conclusion of the analysis. (*Id.* at 137.) In the analysis presented by Defendants, the cell blocks all had non-negative numbers, *id.* at 138, and passed the equivalency requirement of the LSC. (*Id.* at 192.) Plaintiffs effectively challenged the validity and significance of this opinion because: (a) the determinations of equivalency by qualified experts are dependent on subjective factors (*id.* at 141-42); (b) the distance between the cell blocks and the control center is such that a fire department may not be timely notified for alarm purposes; and (c) the operations of the cell blocks and the locking systems pose potential dangers and delays in terms of evacuation.

304. Defendants presented two different methodologies for assessing equivalency: 1) the life safety evaluation system, and 2) Dr. Mowrer's modeling. (*Id.* at 204.)

305. At the same time, the physical limitations of the buildings' occupants must be taken into account when determining whether provision for horizontal exiting in an emergency is required, or whether travel distances must be reduced. Moreover, it is certainly critical to consider whether occupants, in the event of a fire, would be required to exit down open stairs. (Tr. 142, 232-33.)

306. Plaintiffs' expert, Michael DiMascio, reviewed the life safety equivalency scoring performed by Mr. Smith. (*Id.* at 315.) He agreed with defense expert's conclusion that Blocks 7 and 8 satisfied the equivalency system. (*Id.*) However, he was of the opinion that the prisoners in the *Hadix* facility were at substantial risk of serious harm in the event of a fire given all of the pertinent circumstances. (*Id.* at 309, 321.)

C. CONDITIONS IN OTHER NON-HOUSING AREAS

307. There were several hundred gallons of hazardous materials stored in 55-gallon drums on the first floor of the metal furniture factory. (*Id.* at 310-11.)

308. There were well over 120 gallons of xylene, a very flammable chemical, stored in the factory during Mr. DiMascio's inspection; two 55-gallon drums were in use to dispense xylene. Xylene was being poured from the 55-gallon drums into five-gallon pails that were then used to soak spray gun parts. There was also ordinary electrical equipment in the area where the xylene was dispensed. (*Id.* at 312.)

309. As noted above, the MDOC has adopted and implemented recommendations concerning the use of rubber seals for the xylene drums and grounding and bonding the drums.

(*Id.* at 46-47.) It has also adopted and implemented a recommendation that all flammable liquids be stored on the first floor of the industrial building in a non-accessible, locked cage. (*Id.* at 54-55.) There is also an exhaust fan in the caged area that exhausts directly outside. (*Id.* at 48.)

310. It was also recommended that the xylene had to be enclosed in a one-hour rated fireproof room. (*Id.* at 48.) An examination of NFPA 30, which discusses xylene storage, provides that the current storage of the xylene is acceptable. (*Id.* at 48-50, 52-54.)

VII. ACTUAL FIRE EXPERIENCE IN THE CELL BLOCKS

311. In the history of the *Hadix* facilities, multiple fires have been fairly common. (Tr. 227.) During a site visit in the 1980s, the Court, accompanied by counsel in the case of *United States v. Michigan*, directly observed smoke emitting from more than one cell in Block 5.

312. The history of serious riot conditions in other prisons must also be taken into consideration in developing a fire safety system. For example, in the Attica riot, the New Mexico penitentiary riots, and the Camp Hill riots in Harrisburg, Pennsylvania, there was an effort on the part of prisoners working together to set simultaneous fires. (Tr. 227-28.)

313. A prisoner on first gallery of Block 8 ignited a few papers and a sheet in a trash can, then placed his mattress over the fire. There was so much smoke produced by this fire that a prisoner in a cell on the other side of the atrium from the fire could not see the cell directly across from him. (2002 Findings ¶ 1416.)

314. A Carolina jail experienced a catastrophic fire with loss of life. Like the *Hadix* facilities, that jail had manual locks on the cells and was configured in a linear fashion, although it differed in other respects. (Tr. 234-35.)

315. Since December 2004, the Parnall and Egeler facilities have experienced two fires resulting in a total of four injuries to prisoners or staff. There were no injuries to prisoners other than those responsible for setting the fires.

316. From January 1, 2001 to May 5, 2005, there have been no fire incidents in Block 3 at Egeler. (*Id.* at 38-39.)

A. DECEMBER 2004 FIRE IN BLOCK 1

317. On December 13, 2004, Prisoner No. 228931 set a fire in his cell (14-B-1) in the quarantine area on the south side of Block 1. (Pls.' Ex. 33A-1; Pls.' Ex. 33A-3 at 2.) This cell had a solid front. (Tr. 34-35; *see also* Pls. Ex. 33A-8 (videotaped staff report regarding fire).) The prisoner disabled the sprinkler. (Pls.' Ex. 33A-8 at 54:47.)

318. At the time this fire started, there were about six prisoners on the base level of Block 1 South. (Tr. 330.) The fire generated an extremely large amount of black smoke from Cell 14-B-1. (Pls.' Ex. 33A-2 at 14.)

319. Prisoner 185558 was in Cell 18-B-1, two doors down from this fire. (Pls.' Ex. 33A-6 at 8.) Cell 18-B-1 has a solid front door with a food slot in the middle. (Tr. 327-28.) The smoke came into his cell through the crack of the door; there were no vents in his cell. (*Id.* at 329.)

320. The prisoner who set the fire was moved several cells down, from Cell 14 to Cell 3, but not evacuated. (Pls.' Ex. 33A-2 at 1; *see also* Pls.' Ex. 33A-2 at 6; Pls.' Ex. 33A-8.)

321. The Base level on the south side was not released by the officer evacuating the other prisoners in Block 1. In the officer's report, he notes that when the block alarm sounded, he released the breaker bars to allow the evacuation of prisoners from first through fourth galleries.

There is no reference to releasing the prisoners on base (“I broke first thru fo[u]rth galleries to get prisoners out of the building.”). (Pls.’ Ex. 33A-2 at 10.)

322. At trial, Defendants did not contest the fact that the quarantine cells on the base level of Block 1 South were not evacuated. (*See* Tr. 35.) Defendants, though, believed that evacuation was unnecessary. The area not evacuated is the same area that staff never practice evacuating in fire drills. (*Id.* at 110.)

323. As a result of this fire, one staff member was transported first to Duane Waters Hospital Emergency, and then to the civilian hospital within 20 minutes of the fire. (Pls.’ Ex. 33A-2 at 2, 8; Pls.’ Ex. 33A-5.) Two prisoners in the immediate area of the fire (228931 & 185558) were taken to Duane Waters Hospital for medical treatment several hours later, after the prisoners who had been evacuated returned. (Tr. 327-28, 332-33.; Pls.’ Ex. 33A-5.). They were treated for smoke inhalation. (Pls. Ex. 33A-5; Tr. 334.)

324. The characteristics of the smoke and how it behaved in this Block 1 fire, tr. 327-29, undermines Defendants’ proffered testimony that the solid doors in quarantine cells provide substantial protection from smoke in the event of a fire. (*Id.* at 27-28.)

B. MARCH 2005 FIRE IN BLOCK 10

325. On March 23, 2005, a fire started on the catwalk of Block 10 on first gallery behind cells 68-70. (Pls.’ Ex. 33B-1; Tr. 341.) The catwalk on first gallery consists of an open grate. (Tr. 341.)

326. The fire was reported as started at 12:50 a.m. (Pls. Ex. 33B-1.) The fire, caused by a cigarette, ignited a seven-foot long piece of cardboard lying on the catwalk. (Pls.’ Ex. 33B-1.) One prisoner hit the fire with a broom, causing flames to shoot up three to four feet. (Tr. 342.)

When others saw the flames, they started shouting; the lights were out at the time. (*Id.*) Another prisoner threw his coffee on the fire, which extinguished it. (*Id.*)

327. The smoke was intense. After it reached the ceiling, the smoke descended on the tiers and thickened. (*Id.* at 342-43.) At least eight minutes elapsed before any staff responded. (*Id.*) The building was not evacuated. (*Id.* at 343; Pls.' Ex. 33B-1.)

328. At 1:18 a.m., Prisoner 194520 in Cell 63-B-10, one level below the fire, was taken to Duane Waters Hospital for difficulty breathing due to the smoke from this fire. (Pls.' Ex. 33B-2; Pls.' Ex. 33B-1; Pls.' Ex. 33B-4 at 3.) Prisoner 194520 was enrolled in the cardiac chronic care clinic and was a known asthmatic. (Pls.' Ex. 33B-3; Pls.' Ex. 33B-4 at 3.) Prisoner 194520 was diagnosed with and treated for: (1) an acute asthmatic attack secondary to smoke inhalation (resolved), and (2) smoke inhalation. (Pls.' Ex. 33B-4 at 4.)

C. BLOCK 8 FIRE

329. ARUS Ronald Embry has been in 8 Block during fire drills and a fire incident. (*Id.* at 87; Defs.' Ex. 16.) The Fire Incident Report (Defs.' Ex. 16) was prepared by ARUS Embry. The fire involved a prisoner igniting trash in a trash can on the third gallery. (Tr. 88.)

330. ARUS Embry smelled smoke; Officer Reneman extinguished the fire with a fire extinguisher, and the trash can was taken outside. (*Id.* at 89.) The evacuation of the cell block commenced once smoke was observed, and the entire cell block was evacuated. (*Id.*) The evacuation of the cell block took either 15 or 18 minutes. (*Id.* at 90.) No falls or injuries were reported.

331. Normal operations at 8 Block provide that the cell doors are open unless it is count time or at night. (*Id.* at 92-93.) The gates at the end of the galleries are no longer locked or

lockable in 8 Block. (*Id.* at 95-96.) The gates remain open all the time. (*Id.*) Prisoners may evacuate out of both the front and rear entrances of Cell Block 8. (*Id.* at 96.)

VIII. POTENTIAL CONDITIONS IN EVENT OF FIRE

A. BASIC CHARACTERISTICS AND DEVELOPMENT OF THE MODEL

1. THE CONCEPTUAL DESIGN OF THE MODEL

332. Professor Frederick B. Mowrer was retained by Defendants to develop a model of the conditions that would prevail in the *Hadix* cellblocks in the event of a fire. (Tr. 143-44, 149-50.) According to him, fire modeling is an attempt to calculate the conditions resulting from a fire within a room or a building over a period of time instead of as just a snapshot of any particular moment. (Tr. 143-44; Defs.' Ex. 1.)

333. Fire modeling appreciates that fuel has a given potential for producing energy in a fire, but that fires can vary in the rate that fuel is consumed, and this variance in the rate of fuel consumption determines the length of time that the fire will burn. (Tr. 145.)

334. Another principle of fire modeling is that the arrangement of the fuel will affect the rate of fuel consumption. In a given arrangement, the transfer of heat may be insufficient to sustain combustion, while a different arrangement may enhance combustion. (*Id.* at 145-46.)

335. Another known characteristic of fires is that, as smoke rises in an enclosed space, the smoke entrains fresh air, with the result that the volume of smoke increases but the smoke itself becomes less concentrated. When the smoke plume reaches the top of an enclosed space, the smoke begins to bank down and become more concentrated. (*Id.* at 167-68.)

336. Dr. Mowrer used two approaches to fire modeling. One was zone modeling and one was computational fluid dynamics ("CFD"). A zone model assumes that the temperature of

the smoke produced by the fire will be uniform, while a CFD model allows a calculation of the temperature in different parts of the smoke plume. (*Id.* at 147-48.)

337. Dr. Mowrer used a zone model to predict conditions in Blocks 1, 2 and 3 in the event of a fire and CFD models of a fire to predict conditions in smaller cell groupings. (*Id.* at 148-49.) Dr. Mowrer did not produce a zone model of a fire in Block 7 or 8 (Defs.' Ex. 1 at 21), but it was his opinion that conditions during a fire in the Egeler and Parnall cellblocks would be about the same once the smoke descended to the level of the fire. (Tr. 184.)

2. PHYSICAL SPACE ASSUMPTIONS OF THE MODEL

338. Dr. Mowrer visited the cell blocks in March 2005 and walked through cell blocks 2, 3 and 8 and perhaps an additional cell block being either 1 or 7. (*Id.* at 150.) Dr. Mowrer was provided with drawings in which he could calculate dimensions and he checked some measures while in the blocks. (*Id.* at 150-51.)

339. Dr. Mowrer's fire model assumes that the ceiling below the attic is solid so that the space in the attic does not act as a smoke reservoir for smoke generated by a fire in the cell block. This is a conservative assumption because it results in a calculation of a faster dispersal of smoke. (*Id.* at 152-53.)

340. Dr. Mowrer's model relied on the dimensions in Block 3 of Egeler because it was the smaller of the four cell blocks in the Egeler Correctional Facility and therefore, had the volume to contain smoke of the four blocks. (*Id.* at 164.)

341. Prior to inspecting the *Hadix* facilities, Dr. Mowrer developed a report, but following his inspection, he had to modify that report because some of his prior assumptions did not fit with the actual block conditions. (*Id.* at 151-52.) For example, he had assumed that, in the

event of a fire, smoke from the fire would rise through the ceiling up into the attic where it would then bank down. After he actually saw the attic, he changed his models to assume that smoke from a fire would bank down at the ceiling and not penetrate the attic. (*Id.* at 152.)

3. ASSUMPTIONS ABOUT COMBUSTIBLES IN THE MODEL

342. Fire modeling considers the fuels involved in the fire, including both the volume and composition of the fuels. (*Id.* at 144.)

343. Dr. Mowrer's modeled fire was based on an assumption of a mattress being set on its longest edge in the back of the cell and the prisoner's property piled within that space between the mattress and the wall when combusted would generate a fire that was 3' x 6' and was thus considered a fairly severe fire. (*Id.* at 154-55.) He also assumed considerable fuel would be available for the fire—*i.e.*, the inventoried items, a television set, all state issued clothing, and a footlocker of paper. (*See Id.* at 155-59.)

344. There are standard references which determine the heat energy contained within different materials per certain volumes or weights. (*Id.* at 145.) Dr. Mowrer performed calculation by using the standard references together with a property inventory from a representative cell. The volumes and weights of these materials were used to calculate the energy content or the heat of combustion of the modeled fire. (*Id.* at 146; Defs.' Ex. 1, App. D.) Dr. Mowrer also assumed that the materials in the cell were piled in the back of the cell and ignited to produce a rapid fire. (Tr. 147.)

345. Notwithstanding the changes that Dr. Mowrer made in his assumptions regarding the amount of property available to prisoners, Dr. Mowrer's model did not consider all the property that is available to a prisoner in either Egeler or Block 8. Among the additional items of available

property are shaving cream, gel, shower cap, glue, facial tissues, shoe polish, domino games, photo albums, playing cards, and many other items. (*See* Pls.' Ex. 8; *see also* Tr. 289; Pls.' Ex. 19, Attach. C.) He also did not consider that Parnall inmates are permitted to possess an additional footlocker of legal materials.

346. A number of prisoners at Egeler receive medical accommodations that would increase the fuel available in a fire, which accommodations were not considered by Dr. Mowrer. These accommodations relate to prisoners who are afforded additional bedding materials, including mattresses. Some 25 prisoners at Egeler were listed as receiving such accommodations, *see* Pls.' Ex. 39A, and the number may be greater at any particular time due to Egeler's function as a reception center.

4. ASSUMPTIONS AND FINDINGS ABOUT SMOKE

347. Tenability limits are measurements of the conditions that are tolerable for human life. (Tr. 183.)

348. According to the NFPA Fire Protection Handbook, which is one of the authorities that Dr. Mowrer relied on in developing his zone models, *see* Defs.' Ex. 1 at 1, one of the major hazards presented in a fire is impaired vision, which hinders escape from the fire. (Pls.' Ex. 1C at 8-23.) There is a standardized formula for determining the extent to which a fire obscures visibility. (*Id.* at 8-23.) The Handbook states the following:

People's response to obscuration of vision and its detrimental effects on movement speed and wayfinding efficiency is highly variable. Visibility requirements for escape depend to a large extent on the size of the enclosure and the occupants' familiarity with escape routes. Suggested tenability limits for optical density have ranged from 0.5/m (2 m-visibility), for occupants of small rooms who are familiar with escape routes, down to about 0.065/m (15-m

visibility) for large enclosures in which occupants are unfamiliar with their surroundings. (*Id.*)

349. A significant limitation of the zone model is that the model assumes that smoke density is uniform throughout, just as it assumes that smoke temperature will be uniform throughout. This limitation is inherent in the zone model. In reality, the smoke closer to the source of the fire will have higher concentrations of soot, heat and other combustion by-products. (Tr. 289, 291-92, 301-02.)

350. This limitation of the model is particularly important in Blocks 1, 2 and 3. These Blocks contain tiers of cells arranged in the center of each block, in large part dividing the block in two. If there were a fire on one side of the cellblock, the smoke would be denser on the side of the fire. (*Id.* at 291-93.)

351. As a result, conditions on that side of the cellblock will involve higher concentrations of soot, carbon monoxide, heat, and visibility than if the cellblock were configured like Blocks 7 and 8, with an open atrium in the center. Prisoners on the side of the cellblock where the fire started would be exposed to higher concentrations of combustion by-products than predicted by the Mowrer zone model. (*Id.* at 291-93; *see also* Pls.' Ex. 50.)

352. The impairment of Prisoner 194520, who was confined one tier below a fire in Block 10, also illustrates the level of precision of the zone model used by Dr. Mowrer, which assumes that a prisoner below the level of the fire would not be affected by smoke. That is, tenability findings assuming a healthy population cannot be generalized to a population wherein a large percentage suffer grave impairments, particularly respiratory impairments.

353. Another serious problem with the inherent inability of a zone model to predict differences in smoke densities is illustrated by the smoke plume from a cell fire on a lower tier.

The smoke plume would engulf a growing number of cells on each tier as it ascended. (Tr. 302-03.) The smoke within this plume would remain substantially denser than the smoke within the rest of the cellblock. This denser area of smoke would extend from the level of the fire to the ceiling. (Tr. 302-03.) Within this plume, tenability conditions would decrease far faster than predicted by the zone model. (*Compare* Tr. 302-03 to Defs.' Ex. 1 at 17.) Therefore, visibility would fall below tenability limits on segments of multiple tiers significantly before the times predicted by the zone model.

354. Although Defendants' policy provides that the area in the vicinity of a fire is to be evacuated first (Pls.' Ex. 10 at 5, ¶ 19; Pls.' Ex. 12 at 4, ¶ 1), Defendants' policy cannot address the problems caused by a potential fire's smoke plume because that policy is limited to cells in the vicinity of the fire and the policy does not and cannot provide for cell releases on segments of multiple tiers first.

355. The Mowrer report analyzed temperature, soot production and carbon monoxide but did not analyze carbon dioxide or hydrogen chloride or the alkalines from the burning of wool, all of which are either asphyxiants or irritants. (Tr. 308.) Dr. Mowrer explained that the most serious toxic problem is from carbon monoxide. His report indicated that the type of fires modeled would be expected to produce a level of carbon monoxide of 16.9 parts per million ("p.p.m."). (Defs.' Ex. 1.) That is less than one-third of the allowable 8 hour/day, 40 hour/week exposure allowed by NIOSH, according to Dr. Pramstaller. Some prisoners would be exposed to smoke from a serious cell fire for no more than 20 minutes, and most of the prisoners would be exposed for a much shorter period of time.

356. Of the materials in the property list used by Dr. Mowrer for his assumptions, about twenty (20%) percent are plastic, including a plastic television. Soot production rates when plastics are burned can be four to ten times that of normal cellulose. (Tr. 304.)

357. Dr. Mowrer agreed that the yield factor for soot from some plastics is higher than the yield factor he had assumed. If the fuel load consumed in an actual fire had a higher yield factor than the fuel assumed by Dr. Mowrer, the higher smoke yields would produce even lower visibility and lower tenability. (Tr. 182.)

358. If plastic materials are taken into account, the visibility predicted under the Mowrer zone model drops dramatically. For example, Dr. Mowrer's Model predicts that a fire on Fourth Gallery in Egeler would result in visibility falling to 16-17 meters in 108 seconds. If the plastic fuels available in the cells are taken into account, the visibility on Fourth Gallery predicted by the model falls to eight meters in 108 seconds. (Tr. 304-05.)

359. According to Dr. Mowrer's zone model, smoke from a base level fire in Blocks 1, 2 and 3 will fill the upper tiers down to the ceiling of the first tier in approximately 11 minutes. (Defs.' Ex. 1 at 15, 23.) Assuming Dr. Mowrer's model, it would also take about 11 minutes for smoke to reach the same level in Block 8. (Tr. 294.)

360. The model predicts that during the first approximately two minutes, average visibility within the smoke layer will have fallen to less than six meters. Within approximately ten minutes, average visibility will have fallen to two meters. (Defs.' Ex. 1 at 17.) Moreover, visibility within the first tier will fall below fifteen meters sometime between five and ten minutes after the fire begins. (Defs.' Ex. 1 at 23.)

361. Accordingly, even if one applies the less demanding visibility standard noted by the NFPA Fire Protection Handbook, in approximately ten minutes from the beginning of the fire, average visibility within the smoke layer will be reduced to a level below that required for escape from the fire. In fact, conditions in the cellblocks more closely resemble the conditions for which visibility of 15 meters is necessary, but Dr. Mowrer's model predicts that visibility will fall below that level in the smoke layer in less than a minute. (*See* Defs.' Ex. 1 at 17; Pls.' Ex. 1C at 8-23.)

362. In the event of a fire on the top tier in Blocks 1, 2 and 3, Dr. Mowrer's model indicates that the top tier will fill with smoke within 108 seconds. Although it could have been done, Dr. Mowrer made no calculations regarding the visibility or the concentration of toxic substances in the smoke layer in such a fire after the first 108 seconds. (Defs.' Ex. 1 at 19; Tr. 184-85.)

363. If Dr. Mowrer had modeled conditions within a top tier fire after the first 108 seconds, the model would have shown a deterioration in tenability conditions. Oxygen depletion would also occur most rapidly in a top tier fire. (Tr. 186-87.)

364. The time until visibility levels fall below tenability limits predicted by the model will in fact be substantially below the times predicted in Dr. Mowrer's model if a correction is made for his failure to include calculations based on the amount of plastic available as fuels in the cells. As noted, although Dr. Mowrer predicted that visibility would fall to 16 or 17 meters in the event of a Fourth Gallery fire, if the calculation were corrected to reflect the portion of the fuel which would consist of plastics, visibility on the fourth tier would decrease to eight meters in the first 108 seconds. (*Compare* Tr. 304-05 to Defs.' Ex. 1 at 19.)

365. Dr. Mowrer's model, even without necessary corrections that would decrease the time until non-tenable conditions, predicts that visibility would fall below minimally tenable limits in a period of time less than the evacuation times recorded by Defendants during fire drills. Dr. Mowrer's model predicts that visibility in a base fire in Block 1, 2 or 3 will fall below minimally tenable levels in approximately ten minutes, but evacuation times in practice drills are generally more than ten minutes, and range up to 15-20 minutes. (Defs.' Ex. 1 at 17; Pls.' Ex. 1C at 8-23; Pls.' Ex. 21A at 002, 025, 033.)

366. In Blocks 1, 2 and 3, temperatures in cells directly above a cell containing a fire could reach close to 175° Fahrenheit. (Tr. 177.) One may safely assume that injury will occur to a person exposed to a temperature of 175° Fahrenheit as part of a prison fire. (Tr. 297.)

367. The temperature at the floor level in the cells directly above a fire in Block 8 is predicted to reach 130-140° Fahrenheit. It is normally not recommended that fire fighters enter buildings without protective gear when the temperature exceeds 130° Fahrenheit. (*Id.*)

368. If there were two fires in a single cell, visibility would be one-half that predicted by the Mowrer model because the amount of smoke has a linear relationship to visibility. (*Id.* at 299.) If there were two fires in a single cell, using the same total amount of combustible materials as in the Mowrer model, the total smoke from the fire would be produced in approximately half the time. (*Id.* at 291.)

369. If two fires were set in separate cells in the same cellblock, the amount of smoke produced would be double the amount produced by a single fire. (*Id.* at 180-81.) There would be a higher heat release rate, more soot production, and the smoke layer would drop faster because the heat release rates are higher. (*Id.* at 290-91.)

370. If the extra footlocker of property available in Parnall is considered in the Mowrer model, the predicted length of a fire until exhaustion of fuel increases by 27 minutes. (*Id.* at 299.)

371. Dr. Mowrer relied on the Society of Fire Protection Engineers (SFPE) Handbook of Fire Protection Engineering to determine the types of combustion gases that would be produced by his modeled fire. (*Id.* at 159-60.) Dr. Mowrer explained that the modeled fire produced carbon dioxide in the greatest quantity and, in terms of a toxic gas, carbon monoxide was the primary toxin. (*Id.* at 160.)

372. Based on the materials available to prisoners in the cells and the modeled fire, Dr. Mowrer estimated that the carbon monoxide concentration from these fires would reach a value of something around 16.9 parts per million. (*Id.* at 161; Defs.' Ex. 1.) The SFPE Handbook of Fire Protection Engineering states that the lethal limit of carbon monoxide is shown to be approximately 5,700 parts per million for a 30 minute exposure. (Defs.' Ex. 1.)

373. The carbon monoxide to health relationship is an inverse relationship. That means that the higher level of carbon monoxide, the shorter amount of time it will take to reach a lethal level. Analogously, the lower level of carbon monoxide present will yield a much longer period of exposure before there are lethal consequences. Given Dr. Mowrer's calculation, one would not expect a single or even a double fire in the cell blocks to cause a carbon monoxide death to a healthy inmate, *id.* at 161-62, although this calculation cannot be generalized to unhealthy inmates.

374. Mr. Carson's review of Dr. Mowrer's fire modeling has confirmed his previous opinion that the large open space in the cell blocks, the atrium, would have an efficacious effect on dissipating the smoke in the cell blocks and lead to or assist with the preservation of life safety. (*Id.* at 195.)

375. Dr. Mowrer's fire model included a sensitivity analysis predicting what has been seen historically in multi-tiered open cell facilities. (*Id.* at 196.) The model looked at a severe situation (*i.e.*, no sprinkler activation, no one doing anything) and concluded that a fire event would not be a significant event given the large volume. (*Id.*) In the event of an actual fire, Dr. Mowrer would expect that the smoke in Egeler Blocks 1, 2 and 3 would quickly spread uniformly throughout the cell block. (*Id.* at 177.)

376. If there was a vertical divider in the cell blocks (Egeler 1, 2 and 3), it would affect the concentration of the build-up in smoke in the air space generated or resulting from the plume. (*Id.* at 320.) Such a vertical divider would increase the concentration of the plume by having the smaller air space to fill. (*Id.*) You would have the potential to fill the block faster. (*Id.*)

377. Dr. Mowrer's model demonstrated a fire on the Base Gallery in Block 3 as producing smoke that would expand and spread to the ceiling and then flow down from the ceiling until the level of smoke reached a height of approximately 2 meters from the ground in about 25 minutes. (*Id.* at 168.) However, because of such a large volume of space and the space in the cell block to fill with smoke, the smoke would not be at a very high temperature relative to the fire temperature. (*Id.* at 169.)

378. Dr. Mowrer's model predicted that a fire on the Base Gallery would expose the entire cell block to the smoke conditions but because of the dilution that occurs, there would be very mild conditions. A fire on Fourth Gallery would put the prisoners on Fourth Gallery quickly into contact with the smoke but, if those people could be moved out of harm's way efficiently, with the fire up that high the flow of the smoke would tend to stop at the level of the fire and the rest of the block would not be exposed. (*Id.* at 170.)

379. Dr. Mowrer's initial modeling did not factor in the effect of fire suppression represented by the sprinklers in the prisoners' cells or outside intervention by staff. Knowing the specifications of the in-cell sprinkler system, the model would indicate that the sprinklers would activate in about 30 seconds and would quickly suppress a fire (assuming that sprinklers were operational and not deactivated).

380. It is Mr. Carson's conclusion that the prisoner population in the cell blocks can be evacuated before the situation becomes untenable. (*Id.*)

5. ASSUMPTIONS AND FINDINGS ABOUT FLASHOVER

381. Flashover is the stage in a fire in an enclosed space that occurs when the temperature reaches approximately 600° C, or about 1100° F. At the point that flashover occurs, the remaining fuels in the enclosed space ignite almost instantly. (Tr. 165-66.)

382. Dr. Mowrer prepared a FDS model of what would happen within the cell where a fire originates in Blocks 1, 2 and 3. The model predicts "thermal conditions within the cell representative of flashover conditions," so that flashover would be imminent. (Defs.' Ex. 1 at 10, 22.)

383. If the fuel available in a Block 8 cell were arranged in the most dangerous way, flashover in such a cell would also become a possibility. (Tr. 180.) However, in such an event, flashover would become irrelevant because the materials creating the flashover would be consumed and because other materials in the immediate area are not combustible. (*Id.* at 165-66.)

IX. CONCLUSIONS OF LAW AND REMEDY

384. The Eighth Amendment's Cruel and Unusual Punishment Clause forbids conditions that involve the 'wanton and unnecessary infliction of pain,' or are 'grossly disproportionate to the severity of the crime...' *Rhodes v. Chapman*, 452 U.S. 337, 347 (1981); *Hadix*, 367 F.3d at 513.

385. To succeed in an Eighth Amendment challenge, Plaintiffs must establish two elements: (1) a single, identifiable necessity of civilized human existence is being denied (objective prong); and (2) the defendant prison official acted with a sufficiently culpable state of mind (subjective prong). *Hadix*, 367 F.3d at 513; *see also Wilson v. Seiter*, 501 U.S. 294, 298 (1991); *Brown v. Barger*, 207 F.3d 863, 867 (6th Cir. 2000).

386. "Prisoners have the right not to be subjected to the unreasonable threat of injury or death by fire..." *Hoptowit v. Spellman*, 753 F.2d 779, 783-84 (9th Cir. 1985). The contemporary standards of civilized decency that currently prevail in society determine whether conditions of confinement are cruel and unusual. *See Rhodes*, 452 U.S. at 346. It is those contemporary standards, and not courts' own "notions of enlightened policy" that are controlling. *Tillery v. Owens*, 907 F.2d 418, 426 (3rd Cir. 1990). To satisfy this prong, "extreme deprivations are required..." *Hudson v. McMillan*, 503 U.S. 1, 9 (1992), and only deprivations denying "the minimal civilized measure of life's necessities" are grave enough to create a violation of the Cruel and Unusual Punishment Clause. *Rhodes*, 452 U.S. at 347. Harsh and uncomfortable prison conditions do not automatically create such a violation. *Dixon v. Godinez*, 114 F.3d 640, 642 (7th Cir. 1997) (citing *Farmer v. Brennan*, 511 U.S. 825 (1994)). However, a "remedy for unsafe conditions need not await a tragic event." *Helling v. McKinney*, 509 U.S. 25, 33-34 (1993). *See also Hill v. Marshall*, 962 F.2d 1209, 1211, 1215 (6th Cir. 1992) (holding that failure to provide prophylactic medication

to prevent the possible future development of active tuberculosis is “actual injury,” even though prisoner did not develop active tuberculosis).

387. With respect to the subjective prong, there is no violation of the Eighth Amendment unless the defendant is “aware of the facts from which the inference could be drawn that a substantial risk of serious harm exists” and he draws “that inference.” *Farmer*, 511 U.S. at 837. Even if the defendant draws such an inference, he is not liable if he took reasonable steps to avert the harm. *Id.* at 835-36. Rather, deliberate indifference can best be compared to criminal law’s “subjective recklessness.” *Id.* at 839-40. In *Farmer*, the Court, concerned with the subjective component, explained that an “inmate seeking an injunction on the ground that there is a contemporary violation of a nature likely to continue must adequately plead such a violation; to survive summary judgment, he must come forward with evidence from which it can be inferred that the defendant-officials were at the time suit was filed, and are at the time of summary judgment, knowingly and unreasonably disregarding an objectively intolerable risk of harm, and that they will continue to do so...” *Id.* at 845-46. In this case, we are concerned with future conduct to correct prison conditions. If those conditions are found to be objectively unconstitutional, then that finding would also satisfy the subjective prong because the same information that would lead to the court’s conclusion was available to the prison officials responsible for those conditions.

388. The Court concludes that it violates contemporary standards of decency to expose prisoners to housing in which, if a serious fire occurs, scientific evidence predicts that conditions will become untenable well before the staff can reliably evacuate the prisoners.

389. The Court's consideration in this regard is informed by the determination of the Sixth Circuit Court of Appeals that the Eighth Amendment's objective component is violated by forcing a prisoner with a serious medical need for a smoke-free environment to share his or her cell with a prisoner who smokes. *Talal v. White*, 403 F.3d 423, 426 (6th Cir. 2005); *Hunt v. Reynolds*, 974 F.2d 734, 736 (6th Cir. 1992). The Court is persuaded that requiring prisoners to bear the risk of death from fire in an unsafe cellblock is at least equally inconsistent with contemporary standards of decency as is exposing prisoners with a serious medical need for a smoke-free environment to passive environmental smoke.

390. In cases like this one concerned with prison officials' future conduct with regard to prison conditions, "[i]f those conditions are found to be objectively unconstitutional, then that finding [also satisfies] the subjective prong [of deliberate indifference] because the same information that would lead to the court's conclusion is available to prison officials." *Hadix*, 367 F.3d at 526; *see also Farmer*, 511 U.S. at 846 n.9 ("If, for example, the evidence before a district court establishes that an inmate faces an objectively intolerable risk of serious injury, the defendants could not plausibly persist in claiming lack of awareness, any more than prison officials who state during the litigation that they will not take reasonable measures to abate an intolerable risk of which they are aware could claim to be subjectively blameless for purposes of the Eighth Amendment, and in deciding whether an inmate has established a continuing constitutional violation a district court may take such developments into account.").

B. CASE ANALYSIS

391. In determining whether prison conditions constitute cruel and unusual punishment, courts “must examine the effect upon inmates of the condition of the physical plant[,]” including heat and ventilation. *Rhodes*, 452 U.S. at 364 (Brennan, Blackmun and Stevens, JJ., concurring).

392. Other Eighth Amendment cases involving similar fire danger problems include: *Tillery v. Owens*, 719 F. Supp. 1256 (W.D. Pa. 1989), *aff’d on other grounds*, 907 F.2d 418 (3d. Cir. 1990); *Cody v. Hillard*, 599 F. Supp.1025 (D.S.D. 1984), *aff’d in part, rev’d in part on other grounds*, 830 F.2d 912 (8th Cir. 1987); and *Laaman v. Helgemoe*, 437 F. Supp. 269 (D.N.H. 1977). *See also Women Prisoners of the Dist. of Columbia v. Dist. of Columbia*, 877 F. Supp. 634 (D.D.C. 1994); *Carty v. Farrelly*, 957 F. Supp. 727 (D.V.I. 1997); *Toussaint v. McCarthy*, 597 F. Supp. 1388 (N.D. Cal. 1984); *Capps v. Atiyeh*, 559 F. Supp. 894 (D.Or. 1983); *Leeds v. Watson*, 630 F.2d 674 (9th Cir. 1980); *Santana v. Collazo*, 714 F.2d 1172 (1st Cir. 1983); *Masonoff v. Bissonette*, 899 F. Supp. 782 (D. Mass. 1995); *Ruiz v. Estelle*, 679 F.2d 1115 (5th Cir. 1982); *Miles v. Bell*, 621 F. Supp. 51 (D. Conn. 1985); *French v. Owens*, 777 F.2d 1250 (7th Cir. 1985). Such cases are of somewhat limited assistance in terms of making legal conclusions as to separate prison facilities, since the findings, conclusions and remedies must be tailored to the particular facilities.

C. ASSESSMENT OF CONDITIONS IN THIS CASE

1. Physical and Operational Conditions Related to Fire Safety

393. Many of the cases discussed above in which other courts found constitutional violations involved more obvious intrinsically dangerous physical conditions than do the facts of this case.

394. The parties agree that the subject housing units do not meet certain current requirements of the BOCA Code. Defendants' mechanical engineering expert David Sproul accepted the findings of Rosser Fabrap, the architecture and engineering firm retained by the State of Michigan, that:

. . . all of the cell blocks at Egeler violate the "means of egress" requirement of the [Building Officials Code Administrators] ("BOCA") Code; the stairs that would be used for evacuating the cell blocks in Egeler are inadequate in size, enclosure, location, and discharge; and the five-story mezzanine design in the Egeler cell blocks violates the atrium requirement in the BOCA Code.

(2002 Findings ¶¶ 1296 & 1298.)

395. The BOCA Code would not permit a five-tiered cellblock such as those at Egeler or Parnall. (2002 Findings ¶ 1393.) The BOCA Code permits a ceiling height up to 23 feet as long as one of the exits does not require prisoners to descend stairs for more than 23 feet. The purpose of the BOCA ceiling height requirement is to reduce the number of people at risk. The intent of the ceiling height requirement is to assure compartmentalization, reducing the population at risk from a fire in a particular unit and assuring that prisoners can move horizontally to the next unit in the event of fire, rather than being required to negotiate distances in excess of what is permitted by the Code. (*Id.* ¶ 1399.)

396. However, the failure of an old prison building to comply with a contemporary building code does not, by itself, constitute a constitutional violation.

397. The subject buildings also do not meet certain requirements of the Life Safety Code. Defendants stated in their State Prison of Southern Michigan Egress Report dated December 12, 2003, that:

Section 15-3.1.3 of the [Life Safety Code] allows multi-tiered open cell blocks to be considered a single story building if the cell block is provided with a smoke control system and the entire cell block is provided with fire protection.

(Pls.' Ex. 50 at 7 (Defs.' Plan). Blocks 1, 2, 3, 7 and 8 do not have a smoke control system as such a system is defined by the applicable codes. (2002 Findings ¶¶ 1404-05.) The distance a prisoner must travel in these blocks to exit the block exceeds the maximum travel distance of 150 feet permitted by the Life Safety Code. (2002 Findings ¶ 1391.)

398. The provisions of the Life Safety Code include a mechanism for assessing whether the fire safety provisions in a given facility are consistent with the level of safety required under the code, even if the facility does not in all respects comply with the code. (Tr. 138-39; Defs.' Exs. 30a & 30b.) The expert testimony confirmed that the Life Safety Code deemed the facilities technically compliant. (Tr. 130, 315.)

399. However, the Life Safety Code does not include an assessment of all of the factors pertinent to these housing units, including the needs of the population, the adequacy of staffing, the operating procedures for evacuation that are understood, and applicable fire codes. The totality of these factors must go into the planning and design of the *Hadix* facilities.

400. In the history of the *Hadix* facilities, fires have been fairly common. Since December 2004, the Parnall and Egeler facilities have experienced two fires resulting in a total of four injuries to prisoners or staff. There were no injuries to prisoners other than those responsible for setting the fires. From January 1, 2001 to May 5, 2005, there have been no fire incidents in 3-Block at Egeler.

401. In the history of the *Hadix* facilities, simultaneous fires have been fairly common. During a site visit during the 1980s, the Court, accompanied by counsel in *United States v.*

Michigan, directly observed smoke emitting from more than one cell in 5-Block. Also, in last few years alone, the Court has heard evidence concerning isolated fires in the *Hadix* facilities. These fires, even though there is a minimal risk of the fires spreading to other cells and even though the “fuel supply” in each cell is somewhat limited, each present the possibility of smoke inhalation injury to the occupants of the cell as well as the occupants of the immediate surrounding cells, and particularly those with compromised health.

402. Furthermore, in the event of multiple cell fires due to riot or disturbance (which is part of the history of the *Hadix* facilities), there is a significant possibility (depending on the number of fires and the fuel supply) that the fires would cause smoke inhalation injury to all prisoners in the block and that those prisoners, especially those who are medically impaired, would be unable to evacuate to safety. The total distance some prisoners must travel to evacuate during a fire is over 200 feet in all cellblocks, which is unacceptable for prisoners suffering from physical and medical handicaps (*e.g.*, mobility impairments, breathing impairments, cardiac impairments, *etc.*) The disproportionate number of impaired inmates at the *Hadix* facilities is unlikely to change in the future given that the housing of impaired inmates is a direct consequence of the facilities proximity to Duane Waters Hospital. The housing of disabled and chronically ill prisoners at the *Hadix* facilities avoids the additional transportation expenses and medical risks which would be caused by housing the prisoners at a remote facility.

403. There are only two officers in each side of the housing units during the night shift, which places the population at extreme risk in a serious fire situation. The staffing level on the night shift has been reduced from three to two per side of the cellblock. While there may be additional staff who could respond to fire emergencies from other cell blocks and the control

center, to do so they must travel substantial distances, between 600-800 feet, to the facility. Back-up staff would have to travel to the control center to get extra emergency keys and then return a distance of 600-800 feet to assist in opening cells. The time involved to obtain the keys may be from one to three minutes, and the time required to manually unlock all cells may be about two minutes per side.

404. The local fire department, Blackman Township, is two or three miles away and can respond to a fire emergency. During the MSI Laundry fire in October 2003, the actual time between notification and arrival of the fire department was 15 minutes.

405. In many stairways used for fire evacuation, there is also not enough room to pass another person on the stairs, particularly at pinch points.

406. The locking mechanisms frequently break down and fail to open cell doors and other cellblock locks. These lock failures involve both the doors of individual cells and locking mechanisms for groups of cells. For example, between January 1, 2004 and November 18, 2004, there were 18 locking mechanism failures affecting one or more cells in Block 1. At least two of these failures affected groups of cells. One of these failures was not repaired for 89 days. Between January and November 2004 in Block 1 North, ten (10%) percent of all the locks were out of service, some for as long as two months; in Block 2 North approximately fifteen (15%) percent of all the locks were out of service. Between January 1, 2004 and November 18, 2004, there were 39 locking mechanism failures affecting one or more cells in Block 2. At least 13 of these failures affected groups of cells. One of these failures was not repaired for 80 days. Between January 1, 2004 and November 18, 2004, there were 49 locking mechanism failures affecting one or more cells in Block 3. Eighteen of these failures affected groups of cells. One of these failures was not

repaired for 79 days. An outside door that would not unlock was not repaired for ten days. Three locking mechanisms affecting groups of cells were not repaired for over a month. In the period January 1, 2004 to February 23, 2004, there were 22 locking mechanism failures affecting one or more cell in Block 8. Four of these failures affected groups of cells, and one failure affected all cells. One of these failures was not repaired for 103 days. The severe problems with the locking system are not new. A substantial number of the cell locking mechanisms did not work in 2002. (2002 Findings ¶ 1385.)

407. Defendants represent that many of these failures involve locks that fail to lock, and that there are no records of prisoners being locked in their cells and unable to be released. The Court is concerned, nevertheless, that the locking systems, which are essential elements in the fire evacuation system, are in such an unreliable condition.

408. Fire drills in Block 1 have taken up to 16 minutes to complete. Fire drills in Block 2 have taken up to 15 minutes to complete. Fire drills in Block 3 have taken up to 20 minutes to complete. Fire drills in Block 8 have taken up to 20 minutes to complete.

2. Prisoners at heightened risk

409. The Court's determinations are informed by factors that did not play a role in any of the other legal cases mentioned above. A significant factor in this case that differentiates it from the cases cited in the remand opinion is the very high number of prisoners at heightened risk in the event of a fire due to chronic and disabling medical conditions. These heightened risks derive from several different characteristics of the prison population in the *Hadix* facility, including the number of prisoners who would not be able to exit as rapidly as other prisoners because of mobility

problems; those who would be significantly higher at risk of a heart attack, seizure, or asthma attack; and those with communication problems that would interfere with following directions.

410. A substantial number of prisoners in Blocks 1, 2 and 3 would be at significantly heightened risk of harm in the event of smoke inhalation.

411. At the Egeler Facility, the percentage of prisoners with mobility issues is approximately one and one-half to twice as high as the percentage of persons in the general population with comparable mobility problems.

412. The Egeler prisoners are at particular risk, especially those in quarantine who are not let out, those with mobility limitations, and those with breathing problems on upper levels.

413. Based on the evacuation times experienced in Defendants' drills, a significant number of prisoners in Blocks 1-3 are at substantial risk of serious harm in the event of a fire.

414. Prisoners with health problems sometimes take more time to transfer to their destination facility following the reception process, resulting in a concentration of such prisoners in Block 7.

415. The extended length of the galleries in Block 7, the narrow and slippery galleries, and the level of lighting combine with the increased number of prisoners with health problems to place prisoners in Block 7 at heightened risk in the event of a fire.

416. A substantial number of prisoners in Block 7 would be at significantly heightened risk of harm in the event of a fire. The percentage of persons at heightened risk in the event of a fire is much greater than the percentage in the general population who would be at heightened risk.

417. Based on the evacuation time experienced in Defendants' drills, a significant number of prisoners in Block 7 are at substantial risk of serious harm in the event of a fire.

418. There are many more people with functional limitations in Block 8 than in the general adult working-age population. In Block 8, the percentage of the population at risk in the event of fire because of mobility problems rises to four to five times the national prevalence rate.

419. Overall, there are substantial numbers of prisoners in Block 8 who are at significantly heightened risk of harm in the event of a fire. The percentage of prisoners at heightened risk in Block 8 is much higher than the percentage in the general population.

420. Based on the evacuation times experienced in Defendants' drills, a significant number of prisoners in Block 8 are at substantial risk of serious harm

421. Large numbers of the prisoners in the *Hadix* facilities do not have the capability to descend stairs and travel 250 feet or more to an exit in an orderly fashion before conditions become untenable.

422. Large numbers of the prisoners with special medical conditions in the *Hadix* facilities are at increased risk from smoke and fire, particularly those with chronic cardiac disease and pulmonary disease.

423. In order to ensure fire safety, it is necessary to consider the capabilities of the occupants within a facility if they do not fall within the norms of a general population.

424. Defendants' renovations to the housing units do not address concerns with a fire or emergency for those prisoners who would have difficulty with mobility, breathing, strength and endurance, and following directions.

425. In light of the skeleton staff and lack of drills on the third shift, there is substantial reason to think that actual times during a fire emergency would be even longer than the times shown in fire drills in the event of an actual fire.

426. Under current conditions, neither formal policy (evacuating prisoners with medical conditions on Base last) nor current practice (evacuating such prisoners first) is safe. In the case of an actual fire, the practice of evacuating Base prisoners first would dangerously delay removing prisoners from the higher galleries where the smoke would be thickest. At the same time, prisoners on Base who are at heightened risk in the event of smoke inhalation, or who exit particularly slowly, cannot be safely maintained on Base without a smoke removal system.

427. When prisoners would be released from the top down in an emergency, traffic jams or chaotic conditions could develop, particularly if people were noisy getting out. In certain instances, weaker or functionally-limited persons could be injured or could become a barrier for others.

3. Implications of New Analytical Models

428. Another significant factor in this case is that advances in technology make possible more accurate and refined models of the expected consequences of a fire in one of the cellblocks. In this case, the models proffered by Defendants demonstrate, in light of all the circumstances in this case, the highly probable consequence of a serious fire would be the inability to remove all the occupants of the cellblock before conditions became completely unsafe. In reaching this conclusion, the Court is considering the condition of the prisoners; the shocking lack of a reliable unlocking system; the inability of the current fire protection devices to remove smoke during the exiting process; the extremely long distances, pinch points, and unenclosed stairways that prisoners must traverse to exit; and the other evidence presented by the parties.

429. Professor Frederick B. Mowrer was retained by Defendants to develop a model of the conditions that would prevail in the *Hadix* cellblocks in the event of a fire. He testified that fire

modeling is an attempt to calculate the conditions resulting from a fire within a room or a building over a period of time instead of as just a snapshot of any particular moment. Fire models are developed in light of the principles that fuel has a given potential for producing energy in a fire, but that fires can vary in the rate that fuel is consumed, and this variance in the rate of fuel consumption determines the length of time that the fire will burn. Another principle of fire model-building is that the arrangement of the fuel will affect the rate that fuel will be consumed in a fire. In a given arrangement, the transfer of heat may be insufficient to sustain combustion, while a different presentation of the fuel would burn readily. Another known characteristic of fires is that, as smoke rises in an enclosed space, the smoke entrains fresh air, with the result that the volume of smoke increases but the smoke itself becomes less concentrated. When the smoke plume reaches the top of an enclosed space, the smoke begins to bank down and become more concentrated.

- Dr. Mowrer's zone model predicts that smoke density from a fire on Base will reach untenable visibility levels within ten minutes. Within approximately ten minutes, average visibility will have fallen to two meters. This is about half of the time in which Defendants' fire drills demonstrate that the faculties may take for evacuation. Moreover, because Dr. Mowrer's zone model cannot show the expected much higher density within the smoke plume of a fire, in fact a fire on Base would be expected to result in segments of multiple tiers reaching untenable visibility levels much earlier than the ten minutes predicted by the zone model.
- Dr. Mowrer's model predicts that temperatures in the cell above the tier where the fire starts would reach approximately 175° F., a temperature high enough to cause injury.
- Dr. Mowrer's zone model is also intrinsically unable to describe the variations in smoke density within the smoke plume from a fire. The concentration of smoke on the side of cellblock where the fire occurs will be much higher than the concentration of smoke on the other side.
- If two fires were set in separate cells in the same cellblock, the amount of smoke produced would be double the amount produced by a single fire. There would be

a higher heat release rate, more soot production, and the smoke layer would drop faster because the heat release rates are higher.

430. Given all the relevant factors, including the high risk population, the long distances that must be traveled to reach safety, the pinch points that do not allow two people to pass each other, the open stairs, the lack of a reliable unlocking system, the lack of a remote release system in Egeler, the deficient training and supervision of staff, the lack of a sufficient staff to accomplish cell release in the event of a fire at night, and the short period of time before conditions become intolerable in comparison to the length of time that evacuation can be expected to take, loss of life can be expected if a significant fire occurs in the *Hadix* facilities.

431. There is a very substantial, life-threatening risk to the prisoners in the event of a fire in the *Hadix* facilities. There is an absolute probability that the population in Blocks 1, 2, 3, 7 and 8 would be put at substantial risk of inhalation of smoke that is serious, indeed, life threatening.

D. Finding of Constitutional Violation and Remedy

432. Based on the foregoing considerations, the Court finds that there are current and ongoing constitutional violations with regard to fire safety. Prospective relief retaining Section III of the Consent Decree remains necessary to correct that violation. The remedy set forth below extends no further than necessary to correct the constitutional violations. This remedy is also narrowly drawn and appropriately part of the least intrusive means to correct the violation, particularly because it is the remedy that Defendants previously submitted as their remedial plan, with minimal necessary additions.⁹ *See* 18 U.S.C. § 3626(a)(1).

⁹While saying so, the Court understands that Defendants do not consent to compartmentalization. With that said, though, this compartmentalization remedy is drafted by Defendants as the most effective compartmentalization remedy in their judgment.

433. In view of the history of hearings on this issue and the fact that Defendants have previously been provided with the opportunity to develop an appropriate remedial plan, the Court adopts the remedial plan previously submitted by Defendants on December 30, 2002, with certain revisions as set forth below. (*See* Defs.' Brief/Plan to Comply with the Court's Injunction Pertaining to Heat-Related Illness and Defs.' Br. Regarding Alternatives to Compartmentalization to Remedy Alleged Fire Safety Problems and Risks, Dec. 30, 2002, Attach. 1.)

434. The Court will accordingly issue an injunction which reduces the current life threatening risks posed by the current conditions to a risk that is less than substantial by the following remedies:

(A) The creation of horizontal exits through the creation in each block of two smoke compartments, the electrification of the cell doors in the Egeler Facility with remote control capability from the control center, and introduction of an adequate smoke exhaust system in all five blocks;

(B) The replacement of the locking system, which has been subject to a shocking rate of failures in the locking systems and has outlived its useful life; and

(C) The management of xylene and other flammable chemicals stored at the MSI factory by either the construction of a fire safety storage room for the chemicals or the reduction of the total quantity of the stored flammable chemicals to a volume of less than 120 gallons.

435. To provide maximum flexibility as to remedy, Defendants may invoke the provisions of the stipulation of the parties ordered by the Court on June 8, 1990 establishing the SPSM Decentralization Team (SDT). As ordered by the Court on November 27, 1992, the SDT may consider, and approve by consensus, alternative technical and operational means to remedy

the unconstitutional conditions by providing the same level of fire safety redress as that ordered. Involvement of the SDT was intended to facilitate decisions during the design and construction process, and to permit the evaluation and expeditious adoption, without the involvement of the Court, of alternative technical approaches that achieve comparable results.

436. These remedies would address the needs identified by Plaintiffs' medical and disabilities experts, who indicated that changes would have to include reduction in the travel distances and travel times, and greater consideration of the mobility, vision, and other problems that these prisoners have. (Pls.' Ex. 3B at 80, 85; Tr. 271.)

437. The horizontal wall in each block would divide the block in half. It would extend from the ceiling to the Base. A door in the middle of each gallery would allow everyone to exit horizontally at each level from the side involved with the fire to the smoke-free side. (Tr. 236.)

438. The new horizontal wall with an exit door would make it unnecessary for prisoners to exit down unenclosed stairs. (*Id.* at 232, 322-23.). If there were a fire in a stairway, which is a likely scenario, prisoners would still be able to use the horizontal exit to reach the safe side without having to use the stairs. (*Id.* at 236.) Prisoners would have to use stairs only after moving out of the area of danger through the door. They could conceivably remain in the smoke-free compartment and not have to be evacuated from the building. This arrangement would have the added benefit of not requiring an outside evacuation of the prisoner population, which is undesirable. (*Id.* at 237.) Defendants' expert had concurred that it is undesirable to evacuate prisoners. (*Id.* at 139.)

439. Although the construction of the horizontal wall and exit will increase the density of smoke in the area where the fire is located, all of the remedies must be considered in

combination. The remote release system will remove prisoners from their cells quickly, so they can start evacuating without having to wait for a guard to release their locks manually. The smoke removal system should also maintain the level of the smoke above the area of egress. The cell release system, in combination with the smoke evacuation system and the smoke barrier, work together to protect prisoners. (*Id.* at 322-23.) Compartmentalization will also reduce the number of prisoners exposed to fire in any given incident.

440. Defendants' Fire Safety and Egress Report dated December 12, 2003 ("Defendants' Report") was prepared to address the deficiencies found by the Court in the 2002 Findings. (Pls.' Ex. 50.) Defendants' Report explained the benefits of the horizontal wall:

. . . The construction of the horizontal exit reduces the number of building occupants in one smoke/fire compartment by one half, therefore also reducing the number of occupants who have to be removed from their cells by one half.

It is our opinion that constructing a horizontal exit will reduce the time required for occupants to exit the smoke/fire compartment and greatly improve the safety of the occupants. (Pls.' Ex. 50 at 5, 17.)

441. Defendants' Report also addressed the deficiencies in smoke exhaust:

The smoke control system will exhaust a minimum of 150,000 cubic feet per minute out of each smoke compartment . . . Installing the smoke control system will improve the safety of the occupants within the cell block by evacuating smoke out of the open tier cell block design. It will allow more time and greater visibility for occupants of the cell block to exit the smoke/fire compartment. (Pls.' Ex. 50 at 6.)

442. The new proposed smoke control plan described in Defendants' Report would exhaust a minimum of 150,000 cubic feet per minute ("CFM"). This would greatly enhance the smoke exhaust capabilities that are there now which are fairly minimum. (Tr. 239.) This was the capacity recommended by Mr. DiMascio in the 2002 hearing. (2002 Findings ¶ 1404.)

443. Defendants' Report also described the benefits of addressing the lack of a remote unlocking mechanism in Blocks 1, 2 and 3:

The remote unlocking mechanism will allow the staff at the guard station within each of the three cell blocks to remotely unlock the cell doors. This will decrease the time required to unlock the cells. It is our opinion that modifying the existing unlocking mechanisms to remotely unlock the cells will decrease the time required to exit the cells and greatly increase the safety of the occupants. (Pls.' Ex.

50 at 6.)

444. A remote cell release system should have a release from a central location on Base where officers could activate buttons that would open the cells. This was not done in Blocks 7 and 8. If that location became uninhabitable because of smoke, or the officers became disabled, the control center could remotely unlock the cells. (Tr. 238-39.)

445. In light of the continued deterioration of the locking system since the 2002 hearing, the remedies addressed in Defendants' Report are not sufficient, and the locking system must be replaced in a comprehensive and reliable manner.

446. In summary, the plan for remediation set forth in Defendants' Report, with the addition of the repair of the locking system, would correct the life safety deficiencies at the *Hadix* housing facilities. It would aid prisoners in exiting their cells as quickly as possible from the onset of hazardous conditions. It would provide a smoke barrier that would have the effect of dividing the exposed population in half and the additional advantage of requiring only horizontal travel to an area of safe refuge. The smoke exhaust system would evacuate smoke early (offsetting effects of the density of smoke resulting from reducing the volume of space within the compartment). The plan set forth in Defendants' Report would also substantially address the fire safety needs of those prisoners with health problems.

447. To correct the fire safety hazards caused by the improper storage of flammable chemicals in the metal furniture factory, Defendants should either remove the chemicals from the inside location, reduce the quantity of the flammable liquids stored to an amount such that fire safety wall is not required (less than 120 gallons¹⁰), or construct a flammable liquid storage and handling room for storage and dispensing of the flammable liquids.

An Injunction shall enter consistent with these findings, requiring the implementation of the fire safety remedy herein determined as the minimal and least intrusive remedy to correct the intentional constitutional violation found.

DATED in Kalamazoo, MI:
September 14, 2005

/s/ Richard Alan Enslen
RICHARD ALAN ENSLEN
SENIOR UNITED STATES DISTRICT JUDGE

¹⁰(Based on industry standards, *see* tr. at 31.)